Railway Age

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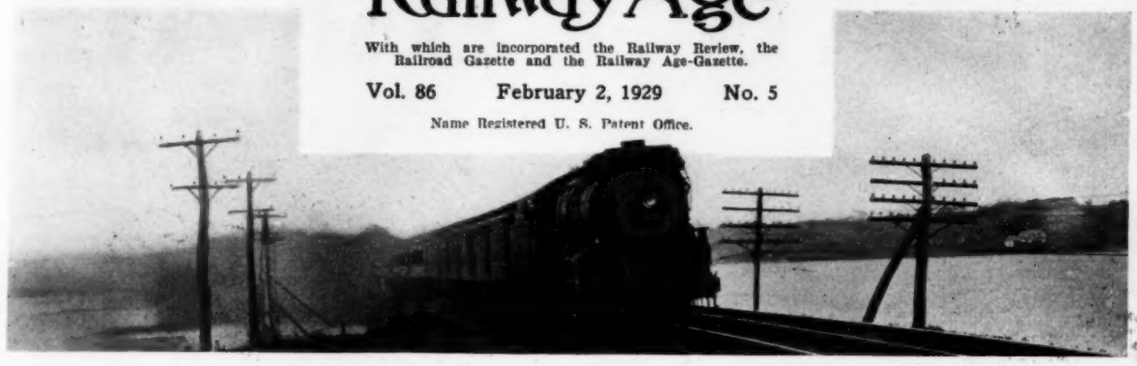

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LUCIUS B. SHERMAN, *Vice-Pres.*
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CHICAGO: 105 West Adams St.
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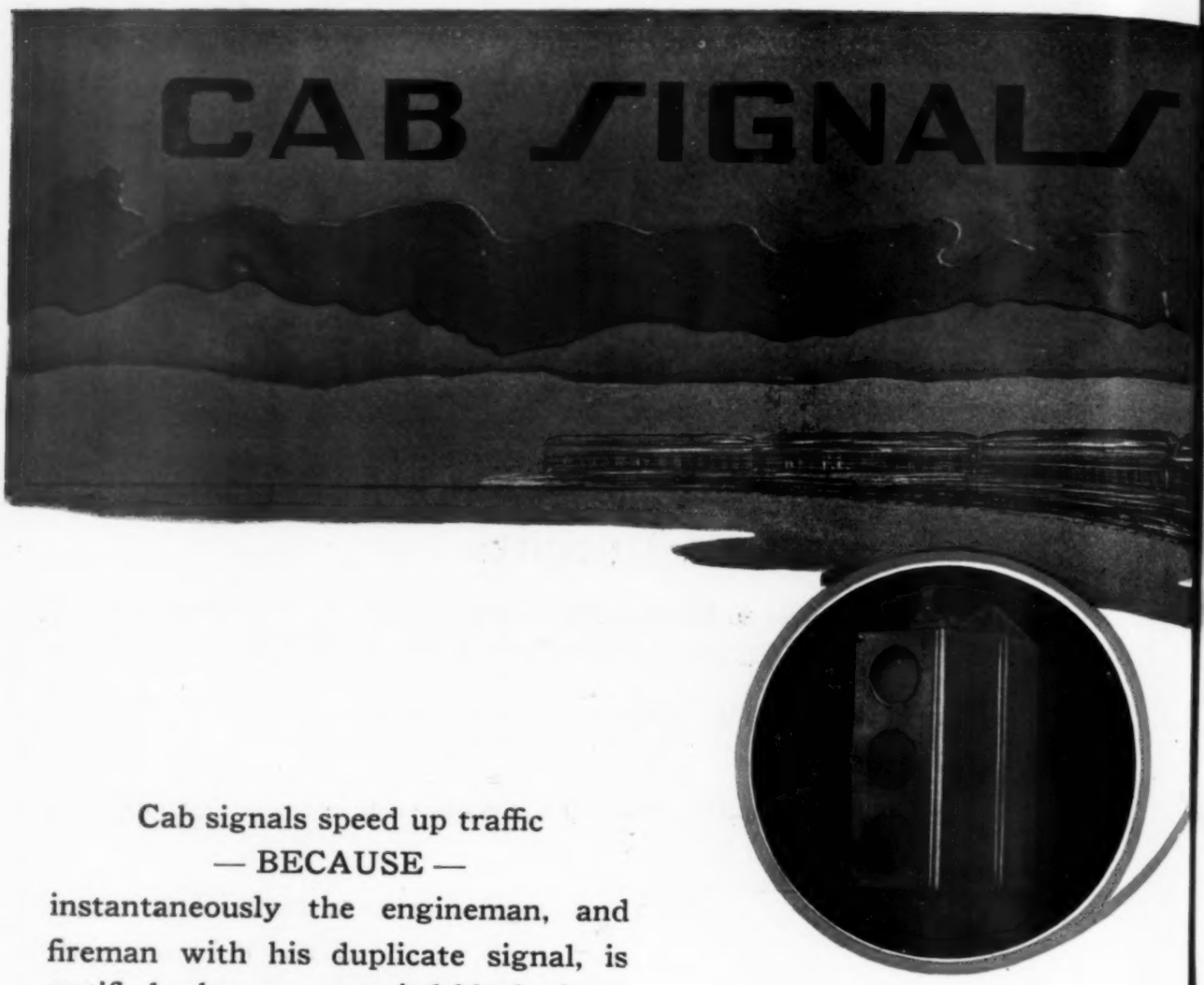

Cab signals speed up traffic
— BECAUSE —
instantaneously the engineman, and fireman with his duplicate signal, is notified when an occupied block clears up, and he can accelerate immediately instead of "dragging" thru the block until the next wayside signal is reached.

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Railway Age

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Another Railway Session at Harvard

ANNOUNCEMENT has been made by the Harvard Graduate School of Business Administration that the special summer session for business executives, held experimentally last year, will be offered again during the coming summer. The courses in railway transportation which were included in the schedules of the 1928 session will be retained. These transportation courses are again to be conducted by William J. Cunningham, James J. Hill Professor of Transportation, Harvard University, and Winthrop M. Daniels, Thomas DeWitt Cuyler Professor of Transportation, Yale University. The progress of the course during the 1928 session was described in detail in the *Railway Age* of August 25, 1928, page 355. Twenty-seven railway men, recruited from nine roads and representing five different departments of the service were enrolled. That railway companies lent their wholehearted co-operation to the 1928 experiment is evident from the fact that each of the 27 students was granted leave of absence with salary and all but two roads paid, in addition, the tuition and other expenses of the employees selected to pursue the course. It is, no doubt, with confident expectations that similar co-operation will be forthcoming that the Harvard authorities have included the transportation courses in the 1929 schedules.

An Idea in Storekeeping

THE Pullman store department has a commendable solution for friction between office and field forces, or between the store department and its customers. When a clerk at headquarters becomes unduly agitated over the incompleteness with which some records reach the office, or the frequency of sudden requests for material which he thinks might have been anticipated farther in advance, and he begins to show his irritation in correspondence, it is frequently the practice, particularly if that clerk has not had shop or field experience, to ask him to spend a day in visiting the shops or coach yards and to make it his business to get acquainted with the men there, notice how they handle material, watch the work being done and observe the problems confronting the men on the firing line. In such assignments, the employee is not subjected to criticism, but is simply asked to forget the office work for the day and make his visit to the shops or other points more or less in the nature of a pleasure trip by a person who is interested in seeing operations and activities of the organization, which it is not possible, by reason of his work, for him to see every day. Frequently these employees come back with a lot of ideas for improving the service, and these are encouraged, but always a larger understanding is obtained of the field men's problems and a spirit of co-operation is engendered where friction existed before. The Pullman method could be applied more widely with beneficial results. In the ever-increasing complexity of stores operations, it is difficult to avoid friction unless all those involved in the operations can be kept thoroughly informed of the problems which confront each of them. While it cannot be expected that friction can be eliminated altogether on railroads owing to their far-flung character, it can certainly be greatly reduced by measures like those resorted to in the Pullman store department, which endeavors to keep a broad perspective before the office forces, not excepting the department heads, with reference to the problems and difficulties confronting the men to whom they supply the materials.

How Others Meet Competition

THE railways are not the only business organizations which have been forced during recent years to seek to hold their customers in the face of competition from new and unusual sources. What the railways are contending with in competing for business with the private automobile, the motor coach and motor truck, and now the airplane, is matched, for example, by that which confronted the phonograph manufacturers when the radio was developed. Just as highway competition, and perhaps to some extent airplane competition, has reduced the passenger revenues of the railways, so the immediate popularity of the radio affected adversely the business of the phonograph manufacturers. For a time the prospects of these manufacturers were very dark; but this situation did not continue long, for the phonograph companies did not delay in getting into the radio business themselves, with consequent favorable effect upon their earnings, not only from the sale of their own radio sets but even from stimulated sales of phonographs. In considering the problem of motor vehicle and airplane competition, the railways may find it to the point to consider this experience of another industry similarly confronted with new competitive conditions.

Economies in Sand Drying

AN adequate supply of the right kind of sand is as essential to successful locomotive operation as proper fuel and water. In fact, the increasing use of sand, not only to reduce slippage, but for cleaning the tubes and flues of oil-fired locomotives, especially on long runs, has made it necessary in some cases to install two sand domes on individual locomotives. Interesting information developed at the last convention of the International Railway Fuel Association indicated that the quantity of sand used and the expense of handling it are not always fully appreciated and that pres-

ent methods frequently leave much to be desired in the way of increased efficiency. Compressed air provides one of the most convenient, but not necessarily the most economical, means of elevating sand to the storage bins. The best method of drying also is somewhat open to question, one road reporting an average cost of 73 cents per ton of sand dried with a coal-fired stove, as compared with 50 cents per ton with a steam dryer. This advantage in favor of the steam dryer was augmented by the fact that its repair cost was only $10 per annum, as compared to $50 per annum for stove maintenance. The committee recommended the application of steam dryers where practical on account of the "lower cost per ton of sand dried, greater capacity per hour, reduction in labor, uniform rate of drying and elimination of the fire hazard." One of the most economical and generally satisfactory sand handling plants is the gravity plant, with wet sand unloaded in a track hopper and hoisted by conveyor to overhead wet storage, from which it is sent by gravity to dryers, dry sand bins, and finally to the locomotive sand domes.

A Letter from Swift & Company

SWIFT & Company are engaged in the meat packing business on a very large scale in Chicago and other places. In consequence, the company controls a large amount of traffic. It has seen fit recently to furnish an excellent example of the way in which railroads are solicited by big shippers to make purchases on a "reciprocity" basis. It has sent a letter to officers of a number of railways. In fact, it appears to have sent it to officers of railways throughout the country. As it appears to desire many railway officers to read the letter, and as probably more of them would read it in the *Railway Age* than anywhere else, we have decided to help circulate it. The letter is as follows:

SWIFT & COMPANY UNION STOCK YARDS CHICAGO
January 16, 1929.

Dear Sir:

The Swift family owns the Mechanical Manufacturing Company, a Chicago corporation which has been manufacturing packing house machinery for a good many years. They also have been putting out the Ellis and the Durable bumping post, with which you are familiar.

Our people have decided to take on the Durable draft gear and the Durable centering device, and we expect our railroad friends to use these articles on a reciprocity basis; with the understanding that they are competitively priced, and their quality is second to none.

I enclose all the data that we have gathered to date on these draft gears. Several of the principal lines already have placed orders with us for them, and they will be utilized one hundred per cent on the Swift equipment in future.

Won't you please have whichever of your departments is in charge of this end of your business make an investigation at this time, particularly of the gear, and let me know if you are agreeable to utilizing some of them on any new equipment that will be built during the year, also on any renewals that take place from day to day on your lines?

Please reply.

Yours respectfully,
SWIFT & COMPANY
Per W. A. M.

WAM*JVH

There are certain facts about this letter that seem to be significant. It solicits business for the Mechanical Manufacturing Company, but it was written on the stationery of Swift & Company and signed by Swift & Company. Why do Swift & Company solicit business for the Mechanical Manufacturing Company? Can there be any doubt that it is because it is believed the large traffic controlled by Swift & Company will be a very potent argument in behalf of purchases from the Mechanical Manufacturing Company, which the letter states is owned by the Swift family?

"We expect our railroad friends to use these articles on a reciprocity basis," says the letter, "with the understanding that they are competitively priced and their quality is second to none." What is meant by "a reciprocity basis?" This is a phrase that is becoming very familiar in the discussion of the relationship between traffic and purchases. Because of their familiarity with the phrase, all the railway officers who read the letter no doubt understood it to mean that Swift & Company give or are able to give the railways to whose officers the letter was addressed a large amount of traffic, and that they expect "reciprocity" for this traffic in the form of purchases from the Mechanical Manufacturing Company. But if Swift & Company give a railway traffic, and the railway renders good service in handling the traffic and charges reasonable rates for doing so, is there not complete reciprocity between the railway and Swift & Company? If a railway makes purchases from the Mechanical Manufacturing Company, and that company furnishes the railway goods of a quality proportionate to the prices charged, is there not complete reciprocity between them? Wherein, then, is the reciprocity between Swift & Company giving a railway traffic and the railway in consequence buying from the Mechanical Manufacturing Company because it happens to be owned by the Swift family.

The letter states that the devices mentioned are to be bought by "our railroad friends," "with the understanding that they are competitively priced and their quality is second to none" If the company making the devices is prepared to sell them in competition with other manufacturers on the basis of quality and price, why does Swift & Company solicit business for it from the railways?

Information that has come to us indicates, as has already been intimated, that this letter has been sent to numerous railways. If this is the case, how are all these railways to gain by accepting Swift & Company's invitation to make purchases from the Mechanical Manufacturing Company on a "reciprocity basis?" Swift & Company must ship over many railways in order to distribute their products throughout the country. Are they going to route freight mainly with a view to rewarding the railways that make purchases on "a reciprocity basis" and punishing those that do not, thus disregarding the character of the service rendered by the different railways? This does not seem probable. Big shippers seldom do business that way. But if they are not going to do business in that way, how are they going to reward all their "railroad friends" who buy from them on a "reciprocity basis?"

Suppose that, backed by Swift & Company traffic, the Mechanical Manufacturing Company becomes highly prosperous and earns large profits for the Swift family which owns it. And suppose some government body should make an investigation and decide that this was because the railways, in order to get traffic from Swift & Company, had unfairly discriminated in their purchases in favor of the Mechanical Manufacturing Company. What, then, would be the plight of those held responsible?

Many persons probably will regard Swift & Company as having been somewhat indiscreet in sending out such a letter. But the incident is more illuminating than unusual. As has already been pointed out repeatedly in the *Railway Age*, the practice of using traffic as a means of influencing or controlling railway purchases has grown rapidly within recent years and is now very widespread. Many concerns with a large traffic are

using it for this purpose. Many concerns with only a small traffic are buying the right to route the traffic of big shippers in order to influence railway purchases.

If the practice of the shippers in using their traffic to influence railway purchases, and the practice of railways in using their purchases to influence traffic, are defensible on sound business principles there can be no possible harm done by giving publicity to them. If they are contrary to good business principles, and not in harmony with the legislation regulating railways which prohibits unfair discriminations and requires that railways be operated with the greatest practicable efficiency and economy, then the sooner these practices are exposed and abolished the better it will be for all concerned—and especially for the railways.

The Menace of High Taxes and the Waterway Situation

PRESIDENT Coolidge, in an address in Washington on January 28, issued a warning to the American people regarding the menace to the national prosperity that is presented by the enormous increases that are occurring in the expenditures made by our governments and the increases in taxes that they are making necessary. He showed that the costs of state and local governments increased from $3,900,000,000 in 1921 to $7,931,000,000 in 1927. "This is such a heavy drain on the earnings of the people", he said, "that it is the greatest menace to the continuance of prosperity. It is a warning that should be heeded by everyone entrusted with the expenditure or appropriation of public funds. It is the reason that further commitments by the national government for any new projects not immediately necessary should be faithfully resisted."

The President's warning will be endorsed by farmers and business men throughout the country. They will unanimously accept the general principle that any person or organization that advocates new or increased public expenditures should be required to justify them by convincing evidence that they will not exceed the benefits the public will derive from them. But how will farmers and business men apply this generally accepted principal to specific proposals for government expenditures? It is to be feared, in view of past experience, that they will regard the principle as applicable or inapplicable to any particular project according to whether they believe the execution of that particular project will be directly beneficial to themselves, regardless of whether they believe it will make a contribution to the national welfare in excess of its cost. In making this statement we have especially in mind the nation-wide campaign now being conducted for extensive development of inland waterways.

"Cheapening Transportation"

What ever may have been true in the past or may be true in the future, it is certainly true that, at present, this country has adequate means of transportation. Nevertheless, vast expenditures for the development of inland waterways are being advocated by the very classes and organizations of business men that are loudest and foremost in denouncing unnecessary and extravagant government expenditures. This policy is advocated as a means of "cheapening transportation". But what is meant by "cheapening transportation?" On every waterway that is maintained or improved with government funds there are some costs of transportation that are defrayed from the freight rates paid by the shippers, and some that are defrayed from taxes paid by the public. When the words "cheapening transportation" are used is it meant that transportation will be cheapened to the shipper or that the freight rates paid by the shipper plus the taxes paid by the public will be less than the rates of the railways for the same service? There can be no question whatever as to what is meant by fully nine-tenths of the advocates of waterway development. By "cheapening transportation" they mean cheapening it to the shipper, and they practically disregard the part of the cost that must be borne by the public.

President Coolidge spoke as the head of the national government. It is a remarkable fact that while there is no officer or department of the national government that is doing anything to promote the development of the railways, to help them to get business or to reduce their costs, there are numerous men in government departments who are actively promoting the development of inland waterways. Their attitude is the same as that of so many business men. Secretary of War Dwight F. Davis, in his annual report and elsewhere, recently has referred to large savings in the country's freight bill that it is claimed are being made by the carriage of freight by water; but he has said nothing at all about what it is costing the public in taxes to effect this saving.

The railways are our great carriers of commerce, and it would seem that they might be entitled to some of the fostering care of the Department of Commerce. But the real energies of that department relative to transportation are being devoted to seeking for streams on which water traffic may be developed, extolling the savings that may be made by carriers by water, and promoting government expenditures to divert traffic from the railways to the waterways. An official of the Department of Commerce recently said that "only as inland waterway transportation directly benefits the *shippers and receivers of freight* should it be given serious consideration". The *Railway Age* wrote him a letter raising a question as to whether the effects upon competing railways, and especially upon the taxes that would have to be paid by the public, should not also be considered, but we have been unable to get any expression of his views regarding these phases of the matter.

This illustrates what is going on throughout the country. The *Railway Age* recently wrote a letter to an officer of the Chicago Association of Commerce intimating that this organization had made no real study, and had not available the results of any real study ever made by anybody else, as to the probable costs of the vast program of waterway development it is advocating, as to the probable traffic that will be handled, the costs of handling it, and so on. We indicated that if we were mistaken in this we would be glad to be set right. His reply, although not intended to be such, completely confirmed our belief that this great organization of business men is basing its entire campaign for waterway development upon assumptions unsupported by any real evidence. No business man would invest his own capital in a project that he had not thoroughly investigated with a view to securing detailed information regarding probable volume of business, earnings, operating expenses, and so on; but throughout the United States organizations of business men are campaigning for vast public expenditures upon inland waterways without having first secured any of the kind of information upon which business men base their decisions regarding the investment of their own capital.

We have read and heard scores of articles, editorials and addresses advocating the extensive development of

inland waterways; but it is significant that in not a single instance have we ever known an advocate of inland waterway development to face squarely and discuss frankly the question of whether the total cost of transportation by canal or improved river—including the taxes paid by the public—is likely to be more or less than by rail. Why do they always dodge this question? Because they dare not face it. All the available evidence is against them.

Enormous Increase of Taxes

Is there any danger to the public of business men joining with politicians in advocating huge government expenditures without full consideration of the resulting probable gains or losses to the public? The total expenditures of all governmental agencies in this country now exceed $12,000,000,000 annually. The excess of government expenditures over tax collections is made up by fees, rents, interest and other miscellaneous income and from borrowed funds. Total government expenditures consume a much larger part of the national income than taxes. The National Industrial Conference Board, in a recent statement, has, however, called attention to the fact that the nation's total tax bill in 1923, only five years, following the great war was $7,234,000,000, while in 1928, ten years following the close of the war, it was $9,169,000,000, an increase within five years of 26 per cent. Taxes are increasing faster in proportion than either population or national income. In 1923 they were less than $65 per capita; in 1927 $76.50 per capita; and in 1928 still more. In 1913, just before the war taxes were only 6.4 per cent of the national income. In 1923 they were 10 per cent of it, and in 1927 they were 12 per cent of the national income. This is what has been occurring as a result of reckless government expenditures largely promoted by the very business men who most loudly deplore the high taxes they cause.

The total amount now paid annually by the American public for the transportation of freight by rail is only about one-third as great as the total annual expenditures made by their governments, and only one-half as great as the amount of taxes collected from the public annually. Furthermore, railway freight rates are declining, while taxes are increasing. The development of inland waterways is being advocated largely as a measure of farm relief. The farmer, it is assumed, will be able to ship his crops cheaper by water. Why give so much attention to the farmer's freight rates and so little to his taxes? According to a report of the Bureau of Agricultural Economics of the Department of Agriculture total taxes on farm property in the United States increased 66½ per cent between 1920 and 1927, while the value per acre of farm real estate declined 30 per cent. During almost the entire time when this huge increase in farm taxes was occurring there was incessant talk about the "farm problem" and means of solving it. What caused these increases in farm taxes? They were largely due to public expenditures for highways and other purposes which were made without adequate consideration as to whether the public benefits resulting would be equal to their cost.

The Vital Question Regarding Waterways

The vital question regarding the proposed development of inland waterways is not whether it will result in reducing the cost of transportation to the shippers and receivers of freight. It is whether it will result in reducing the total cost of transportation, no matter who pays it. If the cost to the shipper is reduced, and the taxes paid by the public exceed the amount by which it is reduced, then the shipper or whoever finally receives the benefit will be subsidized with taxes collected from the public. There is no more reason why shippers should be given a subsidy to help them pay their transportation costs than why they should be given a subsidy to help them pay any of their other business costs. Furthermore, when the public pays taxes to enable the shipper to get transportation by water at less than its total cost and at less than it would cost by rail, the competing railways as well as the taxpaying public are injured.

Never in the history of the United States has any economic view gained such wide acceptance without being supported by any valid evidence as the now generally accepted view that vast government expenditures upon inland waterways will result in benefits to the public. The only valid evidence that could be offered in support of it is evidence showing that upon waterways developed at government expense the cost of transportation—including the taxes paid by the public as well as the rates paid by the shipper—will be less in proportion to the quality of the service rendered than it is or would be by rail. The *Railway Age* asserts that no advocate of extensive development of inland waterways has advanced or can advance, any convincing evidence of this kind—evidence such as would be convincing to any business man who was being asked to invest his own capital. President Coolidge's warning against "further commitments by the national governments for any new projects not immediately necessary" is applicable with more force to the projected development of inland waterways than to any other projected expenditures of public money that is now before the people for consideration.

Two Kinds of Engineers

IF the organizations of the various railways were analyzed it would be found that there is fairly general unanimity of practice in the placing of responsibility on the chief engineer and his staff for the construction of new and enlarged facilities and for the maintenance of the fixed properties to the standards determined by the management. Beyond this point practice differs. On some roads, the engineering department is solely an agency of the management to carry out its plans. On others, its function is enlarged so that it shares, in part, the responsibilities of the management, in the determination of policies for the development of the fixed properties.

Within the last few years the railways have spent increasing proportions of their funds available for capital expenditure for the improvement of roadway facilities. These expenditures have been made, in part to afford greater capacity but, in a far greater degree, to reduce costs of operation, and the outstanding economies in operation that have been effected are evidence of the justification of these expenditures. This record, which is still in the making, is a credit to railway management. It is also an indication of the possibilities yet to be realized.

To develop these possibilities requires increasingly keen analytical ability to separate the meritorious from the unpractical. It is here that the engineering officer, if he be of the proper caliber, can be of the maximum help to his management. The transportation executive, confronted with the pressing problems of traffic movement from day to day, may detect where congestion

exists and higher costs result, but he seldom has the time to study such a problem analytically. The engineer, on the other hand, by reason of his training and his knowledge of costs, should, if sufficiently familiar with the transportation problems on his road, be able not only to detect such demands for relief, but to determine practical means of providing it.

Should he, therefore, wait until called upon for a solution of a problem encountered by another, or confine himself to the execution of a solution handed him, or should he be expected or required so to familiarize himself, directly and through his organization, with the problems of transportation, insofar as they are affected by the roadway facilities, that he is able to determine those places where relief should be provided and suggest ways to provide it? In other words, should he be urged or required to share with the management the responsibility for the development of those facilities which will produce the most efficient transportation machine, or should his activity be confined to the execution of the instructions of the management? A study of railway organizations will show that both practices are in vogue.

In this period in which the railroads are being pressed more than ever before for the maximum in efficiency and economy, it would appear that they can afford to set higher standards and fix more exacting requirements for their engineering officers, not that the engineering officers should usurp any of the functions of management, but that the managements themselves may have the benefit of the best initiative and advice in the solution of their problems.

The Railroad Officer's Duty as a Civic Leader

THE ordinary man in the street, all his time given over to the task of earning his daily bread, may not of his own initiative be expected to consider extensively the welfare of the nation in the time of his grandchildren—three decades or more hence. It is, therefore, a solemn duty of recognized leaders in the community to study these problems and to endeavor to arouse popular opinion about them and to direct it into promising channels. Who are the leaders of public opinion? Educators, statesmen, jurists, yes; but also, perhaps more important than all others, the business men. A glance through the daily press offers conclusive proof that newspaper editors, who have succeeded because they provide the information which the public wants, know that a successful business leader—and this includes the railroad executive—is much preferred by the public as a mentor to a leader in most other professions. Spokesmen for business thus have not only the heavy responsibility of carrying on their difficult work of management from day to day, but also upon them is very largely placed the responsibility for building the political and economic opinion upon which the future well-being of the country depends.

National well-being flows from national economy—using this last word in its broad sense, the production and distribution of commodities and services. A nation exploits its natural resources. If these are many and rich, then perhaps the general level of wealth in the nation may be comparatively high, even if the exploitation of these resources is inefficient and wasteful. On the other hand, if a country's plan of production and distribution is efficient, its citizens may enjoy a comparatively high standard of well-being even if natural resources are relatively meager.

The North American continent has been fortunate in having both a rich supply of natural resources and a system of production and distribution which has been tolerably efficient. The result has been the attainment of the highest general standard of living known. Natural resources do not last forever. As their supply diminishes, or as they become more difficult to exploit, the tendency of rising production costs must be counteracted by increasingly efficient methods of production and distribution, or the standard of living must suffer a loss. America, and more particularly the United States, may soon enter a period when increased efficiency of production and distribution will be of vital importance to its continued prosperity.

It is not the inefficient individual or industry alone who suffers as a consequence of his inefficiency. The nation as a whole has to pay for it. The shiftless or ignorant dairy farmer who keeps a herd which produces but a quarter as much as would high-grade stock, while consuming the same amount of feed, not only impoverishes himself but also keeps up the price of milk, and reduces its supply. By wasting his substance in feeding poor-producing cows, he reduces the savings which otherwise he might be accumulating to put at the disposal of productive industry.

It is the same with transportation. The nation as a whole must pay for inefficiency in transportation. Here a difficult problem arises. Competition may be relied upon to put the inefficient manufacturer out of business if his wastefulness becomes too great. Not so in the business of transportation, however. In this business, the government has interposed to pay a part of the costs of certain forms of transportation, while forcing another to meet all its expenses. The farmer or the manufacturer, having to pay all their costs out of the proceeds of the sale of their products, will quickly suffer from their inefficiency if it exists. In transportation, however, automotive vehicles and inland waterway lines have varying portions of their costs paid by the taxpayers generally. The railways, on the other hand, must pay all their costs out of the charges they make for their services. Rates charged by highway and waterway lines, not being related to total costs of such service, can frequently be made attractive enough to secure business which true efficiency in transportation—considering *total costs* rather than merely the *rates* charged to shippers as the criterion—would require to be moved by rail.

True efficiency in transportation cannot possibly be secured until all agencies which provide the service—highway, waterway, railway and airway—are placed upon a basis of equality with regard to the proportion of total costs which each is required to meet out of charges collected from patrons. Concealed beneath the present varying policy of the government in dealing with the several agencies of transportation lies a tremendous waste, which constitutes a major economic malady afflicting the entire nation. How long will this malady be permitted to continue without steps being taken to eradicate it?

Public education to secure equality in treatment of all transportation agencies is a task to which railroad officers may set themselves with the knowledge that in working for it, they will not only be fulfilling their direct obligation as railroad officers, but also will be performing the no-less-important function of public leaders toward a goal of continued prosperity for their country.

East End of Dome Passing Siding Showing Remote-Power Switch

Texas & Pacific Saves 30 Minutes Per Train

Remote-power switches at passing track facilitate operation —One per cent grade approaching each side

THROUGH the installation of power-operated switch machines for the two switches of a passing track at Dome, Tex., the Texas & Pacific has been able to save an average of 30 min. per freight train on a busy single-track division handling 27 freight and 8 passenger trains daily. The preponderance of traffic is eastbound, owing to an unusually heavy oil movement from the recently developed oil fields in Western Texas, as many as 100 oil tank cars being handled frequently in one train. Situated on top of a hill, with an approach grade of one per cent for nearly two miles in each direction, the control tower is approximately at the center of the passing track, which is long enough to accommodate 100 cars.

Owing to the unfavorable grade conditions, considerable difficulty had been experienced in starting long freight trains after they had stopped to permit the siding switch to be thrown. In fact, it was found impracticable for many tonnage trains to enter the siding and a large number of meets had to be made at Colorado, 2.5 miles east of Dome. However, Colorado is a fair-sized town with numerous street crossings at grade, and hence much time was wasted in cutting trains for crossings. Also, in starting out of Colorado in either direction, trains had to climb grades of one per cent. On the other hand, a train on the Dome passing track is in a favorable position for starting.

Change Speeds Freight Movements

For this reason, the decision was reached to install remote-power switches at the ends of the siding at Dome. The telegraph operator at Colorado station was transferred to Dome where the control machine is located. This remote-power switch installation was placed in service on July 2, 1928, and an examination of the dispatcher's train sheets for two comparable periods, one prior to the new installation and the second about three months afterward, discloses that a great many meets involving freight trains are now made at Dome siding that would otherwise have been made at points immediately east or west of there. A study made by the division superintendent shows that this change in meeting points has so facilitated train movements and saved waiting time, that the average road time of tonnage freight trains over this division has been reduced approximately 30 min. in this 127.5-mile district.

Remote Power Switches

General Railway Signal Company Model-5A remote power switch machines for 20-volt operation are installed at each end of the siding. The machines operate from full normal to full reverse position in about 14 sec. Each switch motor is protected with a time-element relay to open the operating circuit if an obstruction of any kind is lodged between the switch points and the stock rail. This relay, together with all of the other local control relays, is located in the signal case.

Color-light signals are employed at each end of the siding to direct train movements. The signal lamps are arranged vertically, the home signal in each case being a double-unit signal with green, yellow and red lamps arranged vertically in the top unit and yellow and red lamps also arranged vertically in the lower unit. Ten-volt, 18-watt, double-filament rebased lamps are used in the signals. The signal aspects and corresponding indications of the home signals are fully explained in the accompanying table. All of the high signals are

semi-automatically controlled, because this remote control installation is within the new automatic signal territory. The dwarf signals installed on the passing siding to govern movements from the siding to the main line are G-R-S Model-S with yellow and red signal lamps. Storage batteries, located in a concrete box adjoining the signals, are employed for switch machine operation and signal lighting.

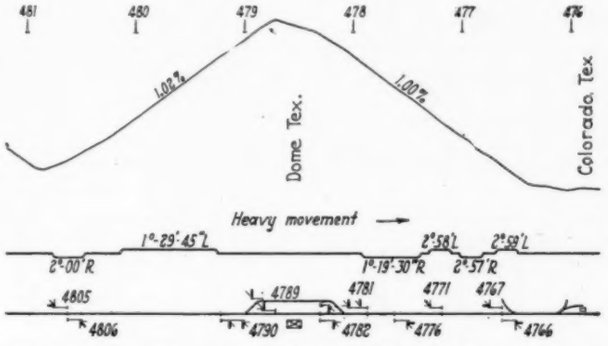
A telephone, housed in a Massey concrete booth, is installed at each end of the siding to enable trainmen to communicate with the operator. It is necessary to use the telephone whenever a train finds a stop signal at the switch and when the reason for stopping is not known to the trainmen. Instructions are received from the operator over the telephone before the switch machine can be operated manually.

Control Machine at Summit of Hill

To control the operation of the switches and signals, the Texas & Pacific uses a control machine with four levers and four spare spaces, which is essentially the same as the dispatching machine installed on the Ohio Central Lines of the New York Central at Fostoria, Ohio. The operator, when seated in front of this machine, obtains information as to the location of the trains and can control the movement of each train. The control levers are arranged in a horizontal row and operate in three positions. In the Dome machine, the levers are numbered *3*, *4*, *5* and *6*, Lever *3* controlling the signals and Lever *4*, the switch at the west end of the siding, while Lever *5* controls the switch and Lever *6*, the signaling at the east end of the siding. When switch Lever *4* or *5* is down, the corresponding switches are lined for main track. When these same levers are moved in the upward position, the corresponding switches are reversed. When these same levers are in the central position, the switch machines remain in the position in which they were last placed. An indication of the position of the switch is always afforded the operator by means of a small pointer connected mechanically to the switch control lever and moving with the lever.

Track Diagram Aids Operator

This track diagram enables the operator to visualize the operation which he controls and enables him to follow the movement of trains. A switch-board lamp is located directly above each switch lever to function as an "OS" indicator. This lamp lights whenever a train passes over the short track section on the main line at each end of the passing track. Ordinarily this light remains energized until the train clears the track section. This "OS" indicator serves another function, in that, when the switch responds to the movement of the lever, there is a brief, but distinct, flash when the switch points open and another flash when the switch



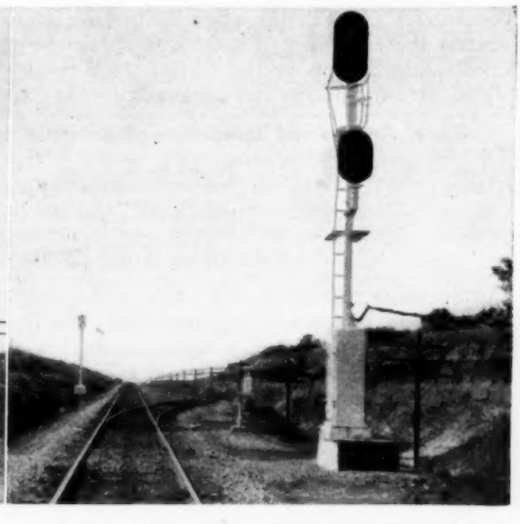
Track Profile, Alinement and Signal Plan of Remote Power Switch Layout at Dome, Tex.

points close. A single-stroke bell is actuated when an "OS" indicator lamp lights, to call the operator's attention.

Switchboard lamps mounted above the signal Levers *3* and *6* serve as approach annunciators. A series of traffic-direction lamps are also controlled by the signal Levers *3* and *6*. For example, when Lever *3* is moved to the upper position, the signals at the west end of the siding will be lined for an eastbound train movement. The traffic direction lights above the control levers will indicate by illuminated arrows, the direction for which traffic is lined.

There is also a key switch mounted below each control lever on the panel. When thrown downward, this key cuts out the audible signal of the "OS" indicator or of the approach indicator. When the keys under Levers *3* and *6* are thrown upward, the wayside signaling is transformed to stick signal control so that when a train accepts the signal, and the red lamp is lighted behind the train, this lamp will remain energized after the

Operator's Cabin at Summit of Hill—The Control Machine Is Located Here

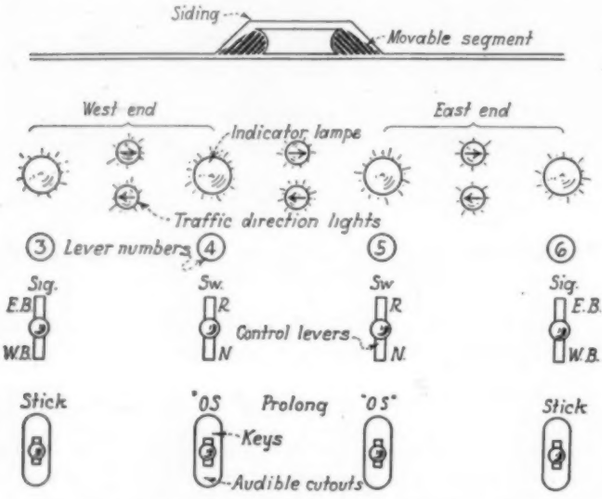


Double-Unit Home Signal for East End of Siding

train leaves the remote-control territory. Also, the "OS" indicator at each switch lever will remain lighted after the train has passed off of the track circuit, if the bottom key is in the upward position. If either the control lever or the switch key below is restored to the central position, the indicator lamp will go out. This stick feature is of value to the operator when he desires to allow one train to pass and to stop a second train without further attention on his part.

Has Safety Features

Approach and detector locking is in effect so that the route cannot be changed after an approaching train has passed the distant signal. If the operator has an



Arrangement of Switches, Keys, Indicator Lamps and Diagram on Control Machine Panel

improper signal displayed for an approaching train, and he desires to stop the train at the switch, he can move his signal lever to the central position, which will make the signal red. Adjoining the switch machine is a small crank stand mounted on a concrete foundation, which serves the dual function of supporting the hand crank for emergency operation and of providing a lever release in case the operator desires to change the route for a train. When the train comes to a stop, one of the trainmen goes to the telephone booth and communicates with the operator. The latter then instructs the trainmen to unlock the door on the switch crank stand and move the crank to the release position, which action releases the approach locking and enables

Signal Aspects and Indications of Entrance Signals

Top Unit	Bottom Unit	Indication
Green	Red	Proceed via main track
Yellow	Red	Proceed via main track prepared to stop at next signal
Red	Yellow	Proceed into siding
Red	Red	Stop—If cause for stopping is not known and route appears clear, call operator at Dome for instructions

the operator to change the route and signal displayed. If no train is approaching the plant, the operator can change the route. but a time-element relay will introduce sufficient delay to protect against the possibility of a train entering the approach section. When a train is in the detector section at the switch, the operator cannot operate the switch.

For the control of the relays employed in the operation and locking of the switches and signaling, a 45-volt Edison storage battery is used, charged by Kuprox metallic rectifiers, so connected that each rectifier charges six cells of storage battery.

President Thinks I. C. C. Slow

WASHINGTON, D. C.

PRESIDENT Coolidge, according to a statement made at the White House on January 25, feels that the position of the Interstate Commerce Commission would be greatly strengthened and that its services would be of much greater value, if it could make its decisions more expeditiously. While he believes that on the whole the commission is a good one and that its members have functioned very well he thinks that it takes a long time to get any action by the commission.

This expression of the Presidents' views was the result of a question as to his opinion on the reported action of the commission in directing Commisssioner Porter to preceed with the work of preparing a consolidation plan, although it is understood that Commissioner Porter is proceeding without any specific action by the Commission, which, officially at least, is still adhering to its recommendations to Congress that it be relieved of the duty of adopting a complete plan of consolidation. The President believes, it was stated, that if the commission is proceeding to comply with the law passed in 1920 it may be a good idea.

In connection with the time taken by the commission to reach decisions, it was pointed out that the government itself has had a sorry experience and that after the commission had spent three years in deciding on the rates to be paid by the Post-Office Department to the railroads for the transportation of the mails the government was told it owed the railroads $45,000,000 for previous services. The President understands that the case will go to the Court of Claims to determine the validity of the order requiring retroactive payments.

* * *

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F. S. McGINNIS, Passenger Traffic Manager San Francisco

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Wood Preservers Consider Ways to Improve Practices

Refinements in methods and studies of service records receive attention at annual convention

THAT the railways are not only the largest users of treated timber, in various forms, but that they also still offer one of the largest undeveloped markets for this material was evident at the twenty-fifth annual convention of the American Wood Preservers Association, which was held at Louisville, Ky., on January 22-24. Among the 242 members present, who with the members of their families formed a group of more than 400 persons, were many engineering officers, lumber purchasing agents, superintendents of treating plants and inspectors of the railways.

Prominent on the program were papers on the Illinois Central's experience with treated timber, by A. F. Blaess, chief engineer of the I. C.* and on The Trend of Wood Preservation, by Grant B. Shipley, president of the Century Wood Preserving Company, Pittsburgh Pa. In addition, Dr. Herman Von Schrenk, consulting timber engineer for a number of railways, spoke extemporaneously on studies that he has been making recently on the service which the railways are securing from creosoted timber in bridges, in which he found that such failures as have occurred in these structures have been due to (1) structural weakness, such as shearing in stringers, and (2) decay in the tops of piles, around drift bolts, etc. To overcome these deficiencies he emphasized the necessity for the more careful selection of timber that will withstand the loads and, particularly, the importance of eliminating the unnecessary mutilation of timber after treatment by chamfering the tops of piles, the application of sway bracing, etc.

In addition to these individual papers numerous reports were presented on the technical work of the association, among which those of special interest to the railways included one on the treatment of car lumber, another on tie service records and a third on fence posts.

At the concluding session H. E. Horrocks, manager, Pacific Creosoting Company, Seattle, Wash., was elected president; C. C. Cook, maintenance engineer, Baltimore & Ohio, Baltimore, Md., first vice-president; J. S. Penney, vice-president, T. J. Moss Tie Company, St. Louis, Mo., second vice-president; and H. L. Dawson, Chicago, secretary-treasurer, (re-elected). S. R. Church, consulting engineer, New York City and W. J. Smith, tie and timber agent, Missouri-Kansas-Texas, Denison, Tex.; were elected members of the executive committee for three years. Seattle was selected as the location of the next convention.

President Condon Emphasizes the Need of Research

After calling the convention to order, H. R. Condon (consulting engineer, Century Wood Preserving Company), president of the association, urged that the organization pause at the completion of the first quarter century of accomplishment, to consider its course for the future. "All industry," he said, "is undergoing remarkable and rapid changes, and this association must be alive to anticipate the future demands of the consumers and producers of preserved wood. The mistake must not be made of believing such work terminable with the adoption and use of specific standards. The development of new preservatives and improved methods of using old ones, advancement in the art of plant operation and methods of impregnation, and the constant discovery of new fields of application of preservative treatment require constant vigilance and effort not only to keep abreast of such developments, but to sponsor and lead them.

"This association can maintain its position as a leader in the continued development of the science and art of wood-preservation," he continued "only by vigorously sponsoring research and the development of new ideas and methods, whether concerned with preservatives, methods of impregnation, or utilization of preserved wood. The requirements for data and information needed by the wood-preserving industry and by the users and potential users of treated forest products have in some instances been a source of embarrassment to committees whose activities naturally are limited by the time and expense that members can contribute to association work. When the limitations of committee work preclude the possibility of providing needed information directly, ways and means should be found to provide for the direction and sponsorship by the association of research and development by suitable and dependable agencies, adequately financed and controlled, results from which can be accepted by all concerned with the knowledge of the control exercised in the development of the project."

Tie Service Records

The committee on tie service records, of which W. R. Goodwin, engineer of wood preservation, M. St. P. & S. Ste. M., was chairman, presented a table of tie renewals per mile on 26 railroads with a total mileage of 204,246. The roads were requested to furnish this information in a form to correspond with the data furnished the Interstate Commerce Commission relative to the crossties renewed per mile of crossties maintained. It is of interest to note that in 1927, 21 of these roads reported that 90 per cent or more of all their renewals were made with treated ties, that on 19 roads renewals per mile were less than 200 ties and that the 7 roads which showed over 90 per cent treated ties in track in 1927 averaged 116 crossties renewals per mile.

The Treatment of Car Lumber

The fact that the treatment of timber for use in car construction is receiving increased attention from mechanical department officers was evident from a report presented by a committee, of which D. R. Elmore, assistant general manager, Fruit Growers Express, was chairman, from which the following was taken:

* An abstract of Mr. Blaess' paper will appear in a later issue.

	A. T. & S. F.			B. & O.			C. B. & Q.			C. & E. I.			C. C. C. & St. L.			C. M. & St. P. (Eastern Lines)			C. R. I. & P.			D. L. & W.			Gt. Northern			Ills. Central		
Year	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg
1900	8,804	192								1,061	294											2,190	210		6,342	229				
01	9,356	166		8,178	246					1,107	290					8,305	210					2,202	218		6,467	229				
02	9,557	204	229	8,263	196					1,146	226					8,617	213					2,212	201		6,972	184				
03	9,766	241	210	8,460	192					1,188	198					8,846	144					2,211	223		7,066	169				
04	10,237	211	215	8,667	225					1,251	133	227				9,125	121					2,305	227	229	7,189	185	202			
05	10,665	256	228	8,904	247	222				1,391	109	192	3,323	369		9,263	97	157				2,346	247	235	7,416	162	190			
06	11,637	197	234	9,052	245	221				1,479	148	163	3,577	392		9,447	116	130				2,377	223	224	7,643	125	169			
07	11,694	266	251	9,166	254	233				1,493	217	161	3,736	301		9,709	94	114				2,422	240	232	6,021	241	180			
08	12,169	301	263	9,231	266	247				1,507	199	161	3,777	275		9,946	176	121	9,006	269		2,439	217	243	6,376	246	192			
09	12,601	293	267	9,260	264	255				1,514	121	159	3,801	198	307	10,001	202	137	9,311	276		2,475	238	244	6,637	249	209			
1910	13,379	281	272	9,370	216	249				1,522	200	177	3,834	364	310	10,043	203	158	9,311	246		2,500	169	229	6,819	293	231			
11	13,869	208	260	9,548	206	242				1,520	134	174	3,925	388	309	10,135	139	167	9,311	265		2,614	223	222	6,980	268	259	8,976	290	
12	14,488	220	273	9,708	276	246				1,572	169	169	3,960	318	313	10,135	163	161	9,605	209	256	2,619	231	227	6,950	226	236	9,436	267	
13	14,766	193	251	9,706	259	240				2,006	289	187	3,973	282	314	10,590	208	187	9,911	221	243	2,644	261	228	8,595	237	254	9,520	256	
14	15,293	178	228	9,653	220	236	12,684	231		2,046	202	203	4,010	269	326	10,697	190	185	10,118	243	237	2,627	255	232	9,669	232	250	9,571	266	
15	15,409	207	213	9,924	309	254	12,854	227		2,055	255	214	4,001	277	307	11,021	183	181	10,044	249	237	2,663	279	254	10,104	229	236	9,658	253	272
16	16,154	201	200	9,973	310	275	12,993	203		1,892	244	236	4,021	212	272	11,072	251	199	10,044	222	229	2,696	195	248	10,074	250	235	9,761	226	260
17	16,276	158	187	10,043	236	267	13,285	192		1,871	187	235	4,090	202	246	11,100	130	193	10,065	183	224	2,663	157	233	10,513	244	236	9,922	179	242
18	16,554	194	180	10,100	194	254	13,331	194	209	1,880	166	211	4,110	205	233	11,107	208	197	10,274	195	210	2,671	121	201	10,676	250	241	10,003	161	217
19	16,711	143	173	10,133	243	259	13,365	162	196	1,867	141	199	4,173	201	219	11,112	242	208	10,274	156	193	2,675	147	180	10,620	253	245	10,066	198	204
1920	16,924	165	164	10,109	255	246	13,365	178	186	1,865	102	166	4,177	156	193	11,087	146	200	10,290	190	182	2,677	159	158	10,632	213	242	10,083	250	203
21	16,933	149	153	10,126	229	232	13,363	177	181	1,863	63	132	4,210	194	192	11,100	161	182	10,378	169	171	2,675	166	150	10,667	184	229	10,125	260	210
22	17,104	156	153	10,171	206	225	13,420	167	176	1,654	131	121	4,228	143	160	11,068	188	193	10,323	191	183	2,678	137	146	10,669	191	216	10,155	249	224
23	17,346	188	148	10,163	207	228	13,530	169	171	1,662	158	119	3,972	191	177	11,782	225	192	10,424	140	162	2,679	102	142	10,697	220	212	10,357	199	231
24	17,709	115	143	10,165	192	216	13,530	150	166	1,661	92	109	3,948	139	163	11,856	204	185	10,371	118	134	2,676	85	130	10,723	201	202	10,529	170	226
1925	18,055	107	137	10,169	200	207	13,586	132	163	1,663	86	106	4,018	140	161	11,740	197	195	10,361	139	143	2,710	98	118	10,772	195	196	10,363	177	211
26	18,474	117	125	10,068	196	200	13,603	151	158	1,662	112	115	4,035	106	144	11,829	205	204	10,428	141	139	2,727	92	103	10,601	201	202	10,969	175	194
27	18,996	132	120	10,665	174	194	13,599	193	195	1,671	121	114	4,042	101	135	11,861	213	221	10,417	153	138	2,726	98	93	10,080	212	206	11,050	177	180
A				1917						1907			1908			1916			1910			1913			1922					
B	3,036			2,601			2,971			2,930			2,808			2,850			2,828			2,613			2,907			2,925		
C	1925		36			34			100			99			99			80			99			91			90			84
	26		30			36			100			99			99			82			100			94			75			82
	27		39			37			100			100			100			94			99			96			79			93
D	1924					60			87			96			83			60			80			82			89			85
	25		86			67						98			85			65			82			85			85			74
	26		66			72						99			89			65			85			87			30			75
	27		92			77			36			99			92			65			87			90			37			78

	K. C. Sou.			Lehigh Valley			Mich. Cent.			M. K. & T.			Monon C. I. & L.			N. Y. C. (East)			N. Y. C. (West)			Nor. Pacific			Penna.			300 Line		
Year	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg
1900				2,807	336		2,853	269														6,275	341		14,799	294				
01				2,838	301		2,976	241		2,410	404					6,712	228					6,329	324		15,143	291				
02				2,863	109		3,053	262		2,401	401					6,266	210					6,493	311		15,901	273				
03				2,893	307		3,136	237		2,560	437					6,292	207					6,636	314		16,751	244				
04				2,911	211	253	3,162	141	234	2,741	460					6,436	243					6,916	280	314	17,330	217	264			
05				2,930	196	229	3,354	148	210	2,900	331	416				6,878	172	213	3,565	245		7,036	286	303	17,886	279	261			
06				3,060	159	195	3,452	173	196	3,044	344	406				6,716	176	202	3,666	257		7,253	280	294	18,527	241	251			
07				3,090	164	211	3,527	110	162	3,065	350	397				6,913	263	213	3,683	261		7,512	346	301	18,645	267	250			
08				3,150	172	184	3,559	110	136	3,232	292	360				7,211	225	216	4,193	266		7,936	251	269	18,963	198	240			
09				3,171	195	180	3,602	212	163	3,316	365	349	808	310		7,258	220	212	4,307	250	256	8,258	296	292	19,016	262	249			
1910	1,196	462		3,131	177	177	3,609	176	166	3,401	449	362	816	257		7,445	249	227	4,668	230	257	8,430	298	293	19,308	240	242			
11	1,846	432		3,199	141	174	3,615	285	191	3,647	466	366	829	396		7,535	229	237	4,770	260	257	8,761	286	294	20,083	235	260			
12	1,251	294		3,245	164	170	3,628	208	210	3,722	401	395	843	385		7,562	219	228	4,849	265	258	8,650	267	282	20,215	290	245			
13	1,261	351		3,277	267	189	3,653	305	249	3,907	342	405	851	360	342	7,766	259	235	5,015	295	264	8,982	371	295	20,441	261	258	4,973	256	
14	1,273	355	379	3,313	232	196	3,758	284	252	3,958	324	396	856	365	353	7,800	271	245	5,036	242	262	9,422	306	297	20,578	292	264	5,113	287	
15	1,289	384	357	3,320	289	219	3,766	335	283	4,021	325	372	858	231	347	8,000	243	244	5,010	301	273	9,636	276	294	20,686	314	276	5,279	256	
16	1,289	338	338	3,364	286	248	3,884	357	256	4,060	382	353	857	289	326	8,054	207	240	5,013	273	279	9,676	247	287	20,829	287	289	5,269	196	
17	1,290	240	328	3,408	176	250	3,922	227	302	4,082	235	322	897	145	276	8,099	197	235	5,069	270	276	9,789	292	288	22,324	212	273	5,306	228	243
18	1,290	237	305	3,396	173	232	3,928	197	280	4,140	209	295	903	166	240	8,246	199	283	5,131	249	267	9,783	230	270	23,003	174	256	5,331	207	235
19	1,290	273	268	3,393	195	224	3,974	144	252	4,196	228	276	903	60	183	8,295	199	209	5,178	189	250	9,783	220	253	23,300	211	240	5,331	266	231
1920	1,302	290	276	3,399	116	190	3,967	126	210	4,227	302	271	906	167	170	8,290	184	193	5,185	163	253	9,889	242	246	23,083	202	217	5,325	289	257
21	1,308	310	270	3,401	133	139	3,952	194	170	4,245	233	241	907	146	141	8,377	220	196	5,188	196	217	9,899	231	243	23,112	232	206	5,304	342	286
22	1,303	249	272	3,413	77	139	3,868	222	169	4,251	163	231	910	146	141	8,411	199	196	5,194	196	203	9,900	167	218	23,182	232	210	5,344	301	280
23	1,324	227	270	3,414	91	122	3,946	208	170	4,275	179	225	911	144	137	8,399	201	197	5,246	147	182	9,798	177	207	23,291	211	218	5,320	320	304
24	1,325	225	260	3,421	109	109	3,946	214	184	4,367	213	222	918	153	151	8,251	173	192	5,367	129	170	9,765	163	196	23,348	177	211	5,380	336	326
25	1,378	132	233	3,424	91	100	3,902	173	194	4,376	237	209	920	135	148	8,190	177	194	5,368	110	156	9,746	178	183	23,406	207	212	5,352	372	329
26	1,300	122	193	3,420	82	90	3,870	135	194	4,379	231	209	932	125	141	8,133	170	184	5,312	93	139	9,729	147	186	23,400	204	206	5,352	294	313
27	1,372	130	177	3,438	92	93	3,870	136	177	4,319	241	220	944	119	134	8,143	160	176	5,341	89	114	9,718	136	160	23,569	165	193	5,256	268	302
A	1914			1914			1913			1904			1910						1915			1913			1920					
B	2,930			2,786			2,675			2,970			3040			2,976			2,935			3,000			2,700			2,882		
C	1929		75			93			89			100						87			91			58			90			82
	26		93			100			94			100			96			94			94			69			97			89
	27		93			100			93			100			96			97			96			96			91			88
D	1924		55			70						63						52			85			52			44			9
	25		62			72			60			73			90			56			92			54			30			18
	26		65			73			-			76			90			61			94			56			30			14
	27		66			76			-			83						66			94			63			61			14

	Southern Pac. (Atlantic Syst.)			Southern Pac. (Pacific Syst.)			Union Pacific			C. R. R. of N. J.			Reading			Missouri Pacific			TOTALS FOR ALL ROADS			
Year	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	Ties	3 Yr Avg	Miles	No. of Roads	Ties per Mile	3 Yr Avg
1900	3,501	201		6,473	230		3,008	261		1,316	218								39,309	12	264	
01	3,884	208		7,893	249		3,058	282		1,337	275								67,114	16	254	
02	3,753	253		7,392	252		4,007	269		1,340	268								90,416	16	238	
03	3,847	269		7,503	196		3,981	186		1,354	246								92,585	16	229	
04	4,052	187	264	7,694	187	233	4,044	303	244	1,373	275	256							95,853	16	223	242
05	4,100	233	234	7,934	194	211	4,064	266	243	1,340	327	278							105,477	18	229	235
06	4,166	398	266	8,018	279	217	4,182	374	270	1,372	306	264							106,654	18	229	230
07	4,343	358	329	8,120	187	206	4,386	317	283	1,403	208	251							111,154	18	247	232
08	4,377	344	254	8,418	324	233	4,393	258	306	1,430	247	251							123,929	19	245	235
09	4,401	259	267	8,677	210	236	4,924	253	294	1,434	259	248							126,852	20	254	241
1910	4,415	269	278	8,907	240	251	5,063	267	290	1,464	242	231							130,911	21	239	243
11	4,504	301	265	9,087	247	249	5,291	246	260	1,491	204	232	2,958	290		9,124	387		135,120	21	262	249
12	4,519	289	272	9,401	225	250	5,465	171	239	1,531	220	234	3,005	297		9,329	406		138,818	24	257	237
13	4,536	271	271	9,534	193	225	5,617	231	204	1,559	240	233	3,032	325		9,451	389		160,694	25	262	223
14	4,613	295	284	9,468	200	222	5,676	246	253	1,612	234	226	3,042	267		9,444	394		161,770	26	256	225
15	4,694	364	303	9,556	232	221	5,685	236	227	1,633	189	215	3,360	290	294	9,446	383	392	183,966	26	268	261
16	4,761	367	325	10,103	243	221	5,722	253	208	1,665	156	206	3,308	192	278	9,466	378	378	186,072	26	253	259
17	4,806	196	303	10,368	188	212	5,815	196	233	1,661	127	187	3,426	170	250	9,329	325	362	189,641	25	207	249
18	4,879	218	258	10,434	244	223	5,994	191	225	1,713	121	165	3,463	166	219	9,353	260	336	191,692	26	198	236
19	4,865	267	226	10,368	235	232	6,024	185	213	1,745	132	146	3,474	153	196	9,323	314	320	190,862	26	208	227
1920	4,929	385	267	10,492	261	218	6,033	206	206	1,749	114	131	3,416	126	163	9,326	326	300	194,615	26	209	215
21	4,992	391	293	10,506	245	239	6,054	184	196	1,734	181	136	3,483	169	156	9,393	287	300	195,332	26	212	207
22	4,999	393	317	10,363	214	244	6,167	203	194	1,743	142	139	3,484	180	159	9,474	300	292	195,946	26	201	206
23	4,988	294	330	10,777	216	236	6,227	198	195	1,748	116	137	3,487	180	162	9,491	265	290	197,336	26	186	203
24	5,043	265	332	12,869	204	229	6,262	215	201	1,749	133	137	3,495	189	169	9,502	327	299	200,828	26	182	198
25	6,046	236	301	12,954	244	225	6,293	214	202	1,751	115	127	3,500	167	181	9,606	325	301	201,793	26	187	194
26	6,077	217	267	13,400	246	225	6,371	208	207	1,755	85	118	3,500	194	186	9,714	280	299	203,352	26	161	187
27	6,301	237	250	13,437	209	224	6,397	183	203	1,770	68	103	3,525	152	180	9,817	256	291	204,242	26	175	182
A	1910						1906									1916						
B	2,918						2,903			2,413						2,882						
C	1925		36												95			61				
	26		60			61			100			100			95			82				
	27		77			62			100			100			96			87				
D	1924		44			57			64													
	25		40									62			69							
	26		41			64			72						75							
	27		46			62			80			84			79							

A = Year in Which Percentage of Treated Ties in Track Reached Twenty.
B = Average Number of Ties Per Mile of All Tracks.
C = Percentage Treated of All Ties Used.
D = Percentage Treated Ties in Track.
5-Year Average Column is 5 Years ending year shown.
Note: Beginning 1927, Miles of Crossties Maintained, as reported to I. C. C. excludes Miles of Bridge and Switch Ties.

Cross Tie Renewals Per Mile of All Tracks Maintained—1900-1927

Coal tar creosote is the preservative most widely and successfully used in stock cars and certain types of open top cars. It is not, however, considered acceptable for closed cars, particularly refrigerators. A suitable preservative for such cars must be both odorless and colorless, and no preservative sufficiently toxic and permanent after application has yet been fully demonstrated to meet these conditions successfully and economically. Certain water soluble salts have been advanced as meeting all of the necessary requirements, but no applications to car lumber in quantity sufficient to form the basis of tests that will prove their worth have come to the committee's attention.

More attention is being paid by car engineers to the limiting of the moisture content of car lumber. Moisture is one of the four essentials for the growth of fungi, with the resultant decay of wood, and, to the extent that it is removed, the work of the wood-destroying fungi is made more difficult. The limiting of moisture places an important obstacle in the path of preservation with water borne salts because of the delay and expense in returning the lumber so treated, to its original state of moisture limitation. Moreover, there is doubt as to the ability to return kiln dried siding, lining, roofing, flooring, etc., to the original low moisture content after impregnation with water solution, without adversely affecting the structure and the outline of the boards. The problem is to increase the use of creosote in the direction in which it has proved acceptable, and to find another treating agent for the service where creosote is barred.

Reports from Individual Roads

The Atchison, Topeka & Santa Fe has continued the application of creosoted nailing stringers and decking to certain flat and gondola cars. It treated sills for 52 stock cars during 1927.

The Atlantic Coast Line is using liquid spiritine and creosote in all concealed wooden material such as sills, sub-sills, posts, braces, side and end plates and other frame parts employed in the repair of its equipment. These materials are heated in a vat to an average temperature of 175 deg. F., and the timber is given from two to four hours treatment, overnight where practicable. It is believed that the life of the timber thus treated is at least double that of untreated material.

The Central of Georgia, in repairing cars, is using wood treated with Grade I creosote oil by the Rueping process with 5 lb. retention. During the last two years it has treated a total of 483,000 ft. b.m. of sills and car decking for application in 694 coal, flat and stock cars. It has been its experience that the creosoting of timber has increased its life, so far as decay is concerned, but that creosoted sills break more easily than untreated sills in ordinary service shocks. Small quantities of car decking were treated with zinc chloride in 1923 and 1924, but this treatment has been discontinued.

The Chicago & North Western reports the use of treated lumber in the decking on a few stock cars purchased in 1926. This decking was treated with creosote in open tanks.

The Chicago & Alton now has on order a sufficient amount of treated lumber (sills and decking) to equip approximately 50 stock cars, to test against oak and pine, and probably a little later will test some stock cars with all posts and braces and perhaps each of the slats from the floor up of treated lumber.

The Great Northern's experience is confined to stock cars for approximately four years. The Lewry empty-cell 6 lb. straight creosote process is employed and is confined to the side and end sills, decking and roofing. Treating plants at Somers, Mont., and Hillyard, Wash., are so constructed as to permit the treatment of car lumber. Sills are framed and roofing and decking are cut to length in the wood mill at Hillyard before treatment.

The Illinois Central reports the use of treated lumber in 400 stock cars purchased in 1925, for which the sub-sills and flooring were treated by the Rueping empty-cell process. The inspectors at the car builder's plant advised that the lumber was free from any accumulation of preservative on the surface and was handled and framed as readily as untreated lumber.

The Missouri-Kansas-Texas uses treated decking, nailers and end sills in coal cars, decking and nailers in flat cars, decking, nailers, roofing, running boards and saddles in stock cars, and running boards and saddles in box cars, as more than 75 per cent of the renewals of these parts were made on account of rot.

Four commercial treating companies reported furnishing treated lumber for car use. One concern has furnished an aggregate of 1,115,500 ft. b.m. treated with creosote, by the empty-cell process, with 6 lb. and 8 lb. retention, during the last two years. Another company had furnished between 300,000 and 400,000 ft. of car decking, treated with creosote, No. 1 distillate, by the Rueping process with a final retention of 8 lb. The third company reported that it had treated 100,470 ft. of car decking with creosote by the Rueping process with 4 lb. retention, for use by one of the principal car building companies. The fourth company reported the treatment in full mill length of Douglas fir stock car decking in 1927 for one of the larger railroads, and again in 1928, the latter being trimmed to length and gained for rivet heads before treatment. This material was treated from the green by the boiling-under-vacuum process and satisfactory penetration was secured.

The Trend in Timber Preservation

By Grant B. Shipley

President, Century Wood Preserving Co., Pittsburgh, Pa.

The total quantity of crossties, miscellaneous lumber and forest products of all kinds treated in the United States in 1927, according to the reports of the United States Forest Service, Department of Agriculture, was about 4,150,000,000 ft. b.m. and the forecast for 1928 was 4,400,000,000 ft. b.m. This is about 500 per cent more than 20 years ago. There are further opportunities for increasing the present annual output of treated material by over 300 per cent.

Where is Increased Demand Coming From?

This increased business cannot be expected from the treatment of crossties, for in 1927 we treated approximately 74,000,000 crossties, the equivalent of 72 per cent of the total number purchased during that year. There are about 400,000 miles of tracks in the United States, containing approximately 1,100,000,000 crossties, of which about 800,000,000 are treated at the present time, leaving approximately 300,000,000 untreated crossties in tracks.

If we assume that 75,000,000 ties are treated annually during the next four years, practically all ties in standard tracks will be treated. However, some of these treated ties which have been in the tracks from 16 to 25 years will have to be taken out and, in view of this situation, it seems plausible to forecast that anywhere from 65,000,000 to 75,000,000 crossties will be required annually for many years to come for maintenance and new tracks.

The more thorough manufacturing, grading and treating of crossties and better protection against mechanical destruction obtained during the last 10 years will increase their life to a point where we can expect not less than 25 years service from creosoted and plated crossties. It is apparent that the policy of treating crossties has reduced our total requirements by nearly 60,000,000 ties annually and it will not be long before annual requirements are reduced by another 25 to 30 million, if those now untreated in track are replaced by preserved ties.

Twenty years ago 82 per cent of all the material treated was crossties. This figure has now been reduced to about 64 per cent; therefore, 36 per cent of the total material treated today consists of miscellaneous lumber and forest products. It is interesting to note that the total quantity of miscellaneous lumber and wood products now being treated, exclusive of crossties, is more than the total quantity of *all* material treated in 1912 or 1918.

There are further opportunities for using salt treatment, especially where creosote oil is objectionable. There are several well known salt preservatives on the market. These have their merits, especially zinc

chloride, enormous tonnages of which have been used in the United States during the last 25 years. There is no question but that lumber treated with zinc chloride will give good results.

An illustration of the possibilities of adapting wood preservative processes to new requirements is afforded by recent developments in the treatment of unseasoned hardwoods. After considerable research it has been demonstrated that the Boulton or boiling process is adaptable for the treatment of green oak and other hardwoods without reducing their strength or serviceability and that deep penetration of the preservative is obtainable. More care and supervision must be exercised in the treatment of hardwoods, however, than with fir. Constant and expert attention must be given each charge and the condensing apparatus must be so arranged that the condensate can be observed. Temperatures must be under close control to avoid injury to the wood during the seasoning process. Research in the treatment of unseasoned pine by a modified Boulton process gives promise of the accomplishment of results superior to those obtained with the usual steaming practice, and continued studies should make available interesting data. The development of a satisfactory method of preserving unseasoned hardwoods has resulted in the conservation of a considerable quantity of forest products within the last two years, has decreased user's maintenance expense and has increased the work done at preserving plants.

When the wood-preserving industry is treating 18,000,000,000 ft. b.m. of crossties and miscellaneous forest products in the United States annually, we will be conserving at least 36,000,000,000 ft. b.m. of timber, or the equivalent of $1,000,000,000 each year. At the same time such a reduction in our timber requirements will save the cut of 15,000,000 acres of forested land annually.

The Trend In Plant Capacities

Twenty-five years ago there were 30 pressure treating plants in the United States, 10 of which were operated by railroads and 20 by commercial or private concerns, whereas today there are 142 pressure plants, 35 of which are operated by railroads and 107 by commercial or private interests.

The approximate productive capacity of all treating plants now in the United States is around 5,100,000,000 ft. b.m. annually, as compared to the actual production of around 4,150,000,000 ft. b.m. Thus, for the present, we have sufficient plants in the United States to take care of all immediate treating requirements. However, some of these plants are not properly located for receiving and distributing treated material at economical costs. Furthermore, many of these plants are old and somewhat obsolete and are, therefore, not efficient or able to handle and do first class work where high pressures are required.

The railroad-operated plants are producing about 27 per cent of all material treated, whereas the commercial or private plants are producing about 73 per cent. Twenty-seven commercial concerns, operating about 73 plants, treat approximately 68 per cent of all material now being treated in the United States.

Creosote Growing in Favor

The trend of treating during the last few years is in favor of creosote oils, about 88 per cent of all materials treated now containing creosote oil as compared to about 68 per cent 20 years ago. About 13 per cent of all material treated now contains zinc chloride, as compared to about 43 per cent 20 years ago. About 15 per cent of all material is now treated with petroleum mixtures, whereas 20 years ago this was experimental. About 1.7 per cent of all material is now treated with miscellaneous preservatives, principally other mixtures of oils and salts.

The consumption of creosote oils in the United States in 1927 was about 220,000,000 gal., which is about 4 times the amount used 20 years ago and about 2½ times the quantity used 5 years ago. The estimated consumption for 1928 was around 225,000,000 gal. About 60 per cent of all the creosote oil now used is manufactured by domestic tar distillers and the balance is imported, whereas 20 years ago only 25 per cent was domestic and 75 per cent imported.

The by-product coke ovens in the United States make sufficient coal tar to produce around 250,000,000 gal. of creosote oil annually, which is 14 per cent more than the present total annual consumption of creosote oil. However, the steel mills have so far found it more advantageous to burn some of this tar in their furnaces and under the boilers, hence only about 50 per cent of the domestic coke oven tar is converted into creosote.

Under a normal trend, the use of creosote oil will no doubt increase at the rate of 6,250,000 gal. annually. Thus, for instance, in 1930 the consumption will be around 237,000,000 gal. and in 1940 around 300,000,000 gal.

In 1927 the United States consumed about 22,000,000 lb. of dry zinc chloride, which is about 36 per cent more than was used 20 years ago. The peak consumption was in 1921 when over 51,000,000 lb. were used, occasioned by the high price and shortage of creosote oils. There has been a steady decline in the treatment of material with zinc chloride since then and it appears that in 1928 only about 20,000,000 lb. of dry zinc chloride was used. However, the normal trend may show an increase after 1928 and the forecast is that 40,000,000 lb. or more will be used in 1940.

The Use of Creosote Mixtures is Growing

The choice of the preservative and the process to be used depend on the species of wood, the climate, nature of the roadbed or other service conditions, length of service life expected or required, and the money available for investment in treated material. Progress in the treatment of crossties and timber in the United States has all been in favor of creosote; yet splendid results have been secured from crossties treated with zinc chloride and zinc chloride mixtures; also creosote-petroleum mixtures.

The Forest Products laboratory tells us that only a moderate quantity of zinc chloride or coal tar creosote is necessary as a toxic. But, in order to get deep penetration and prevent decay through loss of preservative in service and checking and weathering of wood, additional quantities of a carrier for a filler or a solution are necessary, This has been solved by adding petroleum oil, water-gas-tar or coal-tar to either zinc chloride or creosote oil. In 1924 about 11,000,000 gal. of petroleum oil were used in petroleum mixtures, whereas today about 23,000,000 gal. are being used.

About 15 per cent of all material now treated in the United States is treated with petroleum mixtures. Nearly all of this is railroad crossties and timbers. Some railroads which have low cost petroleum oils adjacent to their lines, are convinced that the addition of petroleum oil to creosote increases the service life of crossties and at the same time reduces the cost of treatment. The protective effect of the surface coating caused by "bleeding" and subsequent oxidation of

petroleum mixtures on the surface of wood so treated adds to the mechanical life of the wood in service through the retardation and prevention of checking, splitting and "brooming." The petroleum coating is sometimes referred to as a weatherproofing or waterproofing agent, but since it is not actually impervious to moisture it is likely that the observed benefits are due principally to the influence of the coating in stabilizing the moisture content of the wood, that is, the prevention of rapid absorption and loss of moisture by the treated wood.

The trend shows a great increase in the use of creosote-petroleum mixtures in railroad materials, wherein from 3 to 4 lb. of No. 1 creosote oil per cubic foot is the basis of the mixture, to which is added from 3 to 7 lb. of petroleum oil per cubic foot, depending on the species of wood to be treated. There is no doubt that splendid results will be secured from such treatment but any reduction of safe toxicity requirements involves great risk if long service materials is expected.

In those regions where petroleum is produced and can be delivered to the treating plants at low cost, it is probably economical to use petroleum mixtures. However, in those regions where coke-oven coal-tar or water-gas-tar with a low percentage of free carbon, is available at reasonable cost, there is no question but that creosote-coal-tar mixtures (similar to creosote-petroleum mixtures) can be used and the coal-tar mixtures should give longer life to the treated material than the petroleum mixtures, since all coal-tar is a preservative in itself.

Although our associations and their committees have in many instances opposed the idea of using heavy coal-tar solutions it is a known fact that for many years solutions containing up to 40 per cent of heavy coal-tar mixtures have been used and have given long life to treated crossties. There are millions of crossties now in tracks which were treated with creosote-coal-tar solutions containing a high percentage of tar which will give at least 25 years service, a fact which should be recognized when consideration is being given to supplanting a coal-tar with petroleum in regions where ample coal-tar is available.

Plant Improvements

During the last 25 years considerable progress has been made in improving plant operations and plant equipment. The early plants started off with low pressure treating cylinders 6 ft. in diameter, and for many years it was thought that pressures exceeding 125 lb. were detrimental to the wood, whereas today treating cylinders up to 9 ft. 6 in. in diameter are being used, with a majority of the plants using cylinders from 7 to 8 ft. in diameter for working pressures up to 250 lb., with an average of about 200 lb.

For many years the standard treating cylinder was 74 in. in diameter, having 24 in.-gage track therein, and this was thought to be an economical diameter to use. Such cylinders would vary from 100 to 132 ft. in length. About 5 or 6 years ago it was shown that a cylinder 8 ft. in diameter with standard gage track therein was more economical and today this seems to be about the standard diameter of all plants producing or treating a large variety of miscellaneous wood products. About a year ago the International Creosoting and Construction Company installed what is possibly the largest treating cylinder in the world, which is 9 ft. 6 in. in diameter inside by 166 ft. long, with 1⅜ in. shell plate, constructed for a working pressure of 250 lb. This cylinder will hold a charge of about 2,000 crossties, equivalent to 6,000 cu. ft.

A modern treating plant must be equipped for framing all sorts of timber. Such a plant should consist of cut-off saws, gaining machines, boring machines, trim saws, planers, band mills, etc. Many purchasers require ties to be adzed and bored before treatment. Where refractory woods, such as fir, larch and tamarack, are being used, they should be incised before treatment in order to get uniform penetration of the preservative. Where possible, it will expedite the seasoning of ties and timber if the incision is done at the saw mill while the timbers are green from the log.

Friction vs. Roller Side Bearings in Derailments

By E. G. Goodwin
Vice-president, Standard Coupler Company

RECENTLY articles have been published in the *Railway Age* concerning the action on curves of freight car trucks of different designs and some of their important appurtenances.

Certain tests were conducted by T. H. Symington & Son, Inc., Baltimore, Md. Unfortunately, up to the time the results of those tests were made public, those responsible for them evidently failed to realize the magnitude of the principal contributing factor causing derailment under the special test conditions; namely, wheel slippage. This wheel slippage, or rather resistance to wheel slippage, was so nearly 100 per cent responsible for derailing that any other cause or causes were too nearly zero to determine or estimate the extent of their effect. While this appears generally true with reference to the various truck arrangements used, I will confine myself to the side-bearing phase of the subject.

Side-Bearing Friction not Shown

No derailing tests were made, according to the report, which showed, or even as much as indicated, comparable effects of friction as against roller side bearings. Nevertheless, figures were quoted tending to show no difference in the effect of these radically different types of side bearings. In one article it was claimed that one of the most interesting questions raised by these tests is the relation of side-bearing friction to derailments caused by warped track surface. In the single test using the slide or friction side bearing and the one on which the above claim was based, the outer rail was depressed under the forward truck, obviously the truck to derail under this condition. In practice there is always play between the bolster ends and side-frame columns and since this play was all stored up to allow the guiding wheel partly to derail before absorbing this slack, the bolsters required no relative movement to accommodate the change in side-frame alinement. Therefore, there was not due to be any side-bearing movement and consequently the estimated resistance did not necessarily exist.

It has been pointed out that the roller side-bearing and the friction side-bearing trucks both derailed with identically the same amount of track warp. While a single test, or pair of tests, proved nothing, the indicated results, instead of being surprising, were precisely those that should have been expected. As the truck bolster did not necessarily move relative to the body bolster, this test, therefore, was no measure of the rela-

tive side-bearing friction or its effect. Both articles on this subject, which appeared in the *Railway Age* of October, 17, 1928, were decidedly misleading with respect to side-bearing effect on truck action. The inaccuracies of the test, the limited number of tests made, the inconsistency between the different tests and the variable conditions unaccounted for, were far too great for drawing, or even guessing at conclusions in spite of the several statements to the contrary.

In a later article* by T. H. Symington and presumably after learning that earlier reports differed materially from the readily accepted and undisputed findings of A. M. Wellington, published in 1887, he sets forth more specifically a summary of accomplishments claimed in the October test. The first and second of these are obvious and evidently known to every railway engineer. The third is only true where the truck bolster and side-frame play is taken up as on entering curves and thus due to the presence of swiveling resistance of the rear truck only. The fourth is by no means new and has been dealt with by every thorough car designer. The fifth and sixth are not conclusive and certainly have not been proved by the tests referred to.

As pointed out above, the wheel slippage played such a controlling part in these derailing tests that little or nothing can be said authoritatively as to the effects of other possible contributing causes.

A Practical Lesson

The one practical lesson these tests emphasize is that side-bearing clearance should be provided proportional to the rigidity of the car body and the distance between truck centers. While this is well appreciated by students of the subject, it is often ignored or overlooked in favor of a standard side-bearing clearance for all types of cars.

It has already been proved that the flexible type of car, such as the open-top, flat-bottom gondola, can be operated successfully with no side-bearing clearance whatsoever and with any side bearing spread or type of truck. On the other hand, the more rigid type of car, particularly of the closed-top type, should have side-bearing clearance to provide amply for all track warp in excess of that which can be safely accommodated by limited car-body warp and spring action.

Mr. Symington's article is a decided improvement over the earlier ones in so far as a correct analysis is concerned. However, he fails to use such terms as would fully correct any false impressions created by the former articles and, of course, there may be many who chanced to read the earlier and more misleading analysis only. The writer challenges the accuracy of the following paragraph: "When a car is in a curve and the weight on either truck on the outside rail is sufficiently reduced by track warp or car roll, ***** the front outside wheel flange of the truck will climb before it can overcome the essential wheel-slippage friction of the rear truck, or the wheel-slippage friction plus the truck-swiveling friction of the forward truck."

It was pointed out that some of these tests were made on a 10-deg. curve, while other tests were made on a track of approximately 45-deg. curvature and an effort made to compare the results, but without taking into account the fact that the sharper curve changed the relative fit between the guiding wheel and the rail. It is evident that the sharper the curve, the farther forward the contact point between the wheel flange and the rail head. This would have a direct bearing on the swiveling leverage and probably otherwise affect the guiding influence on account of a different flange contour at the contact point.

A Reason for Inconsistencies

Reference has been made to the inconsistency between the different readings of the comparatively small number of tests conducted. This inconsistency can easily be accounted for by the ever-changing irregularities of the surfaces in contact, particularly at this extremely low speed. This discrepancy, of course, can readily be eliminated by conducting a sufficient number of tests to strike a dependable average.

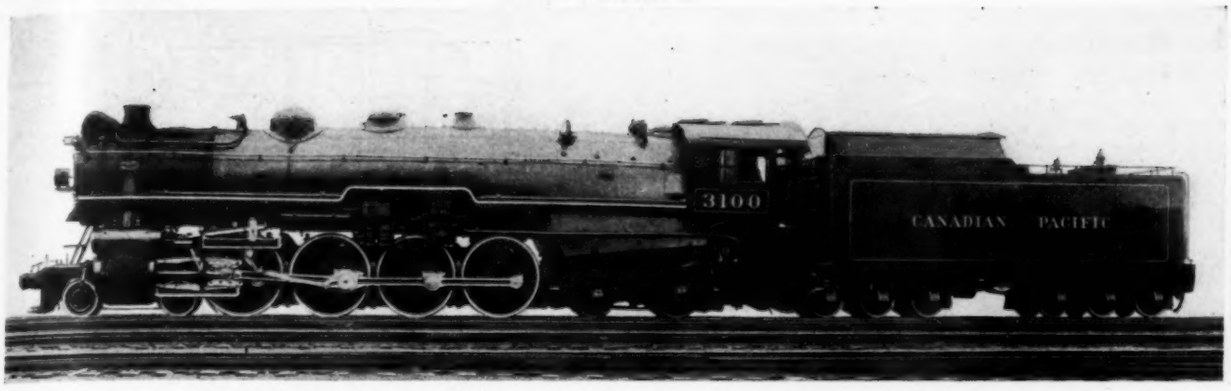
Another major discrepancy in measuring the comparative resistance to truck swiveling when the truck was equipped with roller side bearings and when equipped with friction side bearings is that no allowance is made for the constantly decreased side-bearing clearance, in the case of the roller bearing, brought about by the angularity of the truck. In this particular case a roller bearing was used having a decided pitch to the roller runway. This introduced a lifting motion or amplified warp, but even with this adverse roller-bearing condition, there was shown five to seven times less side-bearing resistance to swiveling as was obtained with the flat friction type. Had horizontal runways been used, both above and below the roller, the difference in side-bearing resistance would undoubtedly have been greatly increased. Friction side bearings offer several times the resistance to swiveling per pound of load as does the center plate, largely if not altogether, because of the greater distance from the axis of rotation. At the same time an unrestricted roller bearing, or one that is 100 per cent efficient, offers no swiveling resistance.

A careful analysis will readily show that the tests above referred to were practically nothing more nor less than a measure of rigidity of the car body, a substantial contrast to the specified purpose of the test. This rigidity, combined with sufficient track warpage, allowing for side-bearing clearance and other minor amounts of track warpage, would produce sufficient inequality in wheel loading for the horizontal or guiding component of the guiding wheel to be overcome by the friction between the wheels and the rails caused by the vertical loading of three wheels, including at least one wheel on the side of the truck supporting the greatest vertical load.

The track warpage, when combined with other conditions under which most of these tests were made and where reasonable side-bearing clearance was provided, was excessive and not encountered under ordinary operating conditions.

Fortunately, under normal conditions, cars behave very satisfactorily on entering, passing over, or leaving curves. In passing over a curve from tangent track to tangent track, the forward truck has the greatest front-wheel flange pressure on entering a curve and fortunately, greater vertical load, while on leaving the curve, the leading wheel of the rear truck has the greatest flange pressure, but again this wheel has the greatest vertical load, while in negotiating the center of the curve there is no difference in the loading on the outside wheels of the front and rear trucks, no relative swiveling action, no track warp and the chances are the same that either truck will not derail, particularly after the truck bolsters have adjusted themselves to the mid-position between the side-frame columns, all of which would seem to a very fortunate accommodation of conditions.

* See the *Railway Age* for December 8, 1928, page 1137.



One of the Two 4-8-4 Type Locomotives Built at the Canadian Pacific Angus Shops, Montreal, Que.

Canadian Pacific Builds Two 4-8-4 Type Locomotives

Total weight reduced considerably by the use of alloy steel—Develop a tractive force of 60,800 lb.

THE Canadian Pacific has recently put into operation, two experimental 4-8-4 type passenger locomotives, which were designed by the railway company's mechanical department and constructed at the Canadian Pacific's Angus shops in Montreal, Que. These locomotives are numbered 3100 and 3101 and designated as the K-1 class. Their maximum tractive force is 60,800 lb. and as far as is known, they are the heaviest and most powerful passenger locomotives in use in the British Empire.

The standard passenger locomotive now in operation on Canadian Pacific lines is a Pacific type locomotive of 45,000 lb. tractive force and which, in its present or modified form, is of ample capacity for general service. For the heavier passenger trains with severe schedules and for heavier grade work, the need is being felt for more powerful locomotives and the K-1 class has been designed to supplement the standard Pacific type locomotive for grade work or on heavier trains coupled with severe schedules. At present, the two engines are operating east of Toronto to Smiths Falls, a distance of 212 miles, or covering two divisions.

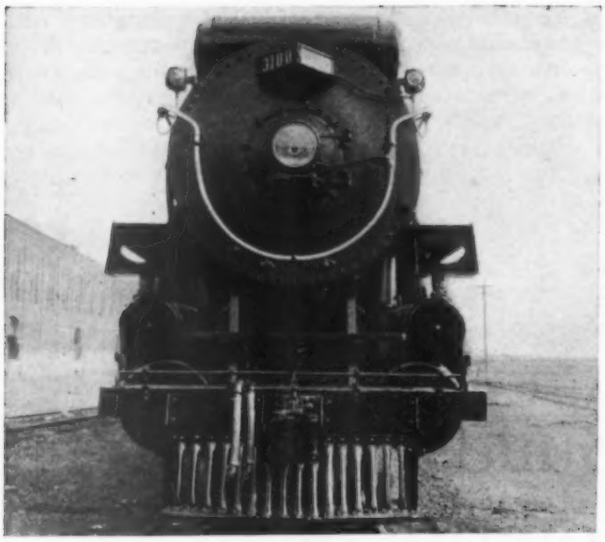
The locomotives operate at 275 lb. boiler pressure, which not only improves the economy, but gives a smarter locomotive with better acceleration. The high pressure reduces the cylinder diameter to 25½ in., the stroke being 30 in. The driving wheels are 75 in. outside diameter; the weight on drivers, 250,000 lb., and the total engine weight, 423,000 lb. As was mentioned above, the maximum tractive force of these locomotives is 60,800 lb. This is based on 85 per cent of the boiler pressure as provided for in the customary maximum tractive-force formula. It is pointed out, however, that with the continued increase in boiler pressures and improvements in efficiency and capacity of boilers this formula is really misleading and a more consistent formula would provide for a varying factor with the use of increased pressures.

The boiler has probably utilized more nickel-alloy steel than any other locomotive boiler yet constructed. The shell plates, firebox sheets, tube sheets, staybolts, arch tubes and arch tube ferrules are all of nickel steel. All other parts including flues, tubes, rivets, braces, etc are of carbon steel, no wrought iron being used in the construction of these locomotives in any detail. The use of nickel steel in firebox and tube sheets was resorted to not only to increase the factor of safety with the higher boiler pressure but also to assist in resisting the expansion and contraction stresses, particularly in the radius of the tube sheet and in the side and throat sheets. The barrel course sheets and welt plates are the railway company's standard nickel steel which has been used not only for greater toughness desirable with the increased boiler pressure but on account of the 28 per cent saving in boiler weight realized by the use of alloy steel instead of carbon steel. The boiler is of conical construction and has an outside diameter of 84¼ in. and an outside diameter of the third course of 96 in. The length over tube sheets is 20 ft. 6 in. with a 5-ft. combustion chamber. The total combined heating surface is 7,043 sq. ft. which, with 93.5 sq. ft. of grate area, provides 1 ft. of grate area for every 75.2 sq. ft. of combined heating surface.

A type E superheater is used with 28 double and six single units. The Elesco feed-water heater is also used for boiler feed.

In order to reduce the size of holes into the boiler a separate manhole 17 in. in diameter, has been placed directly back of the main dome. The safety valves are screwed into the manhole cover and a lifting ring is provided so that the entire ring and cover with safety valves can be removed for access to the boiler for examination purposes.

The main steam dome is only large enough to provide proper space and cross-sectional area for the stand pipe. This arrangement has permitted keeping the hole in the boiler down to a size of 17 in. by 20 in. A shut-off valve of a new design is attached to the under side of the main steam dome cover, the valve itself sitting on top of the stand pipe. The valve is of flat plate type



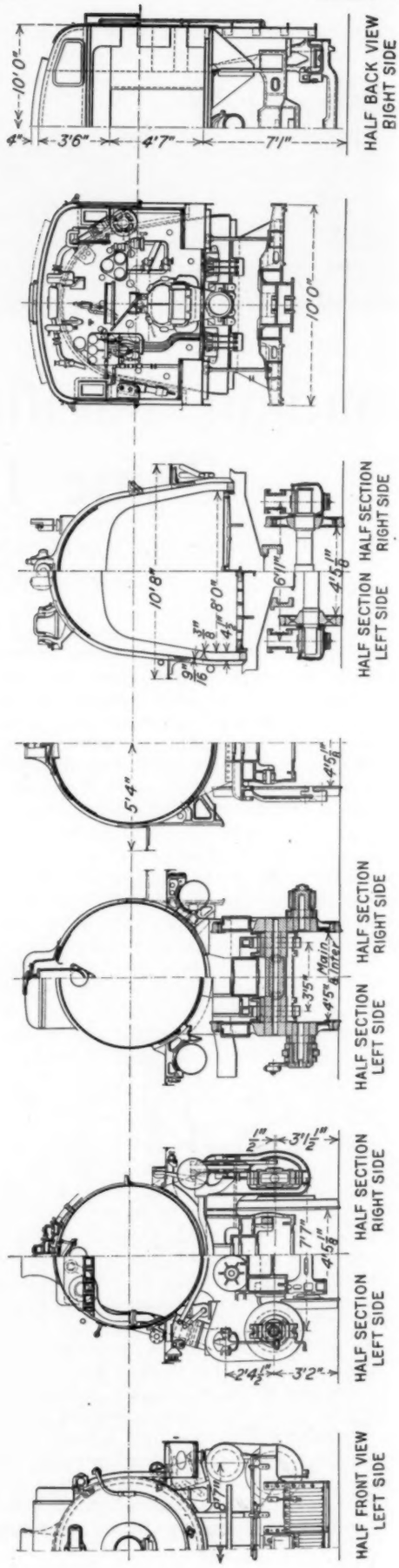
A Front View of One of the New Canadian Pacific Locomotives

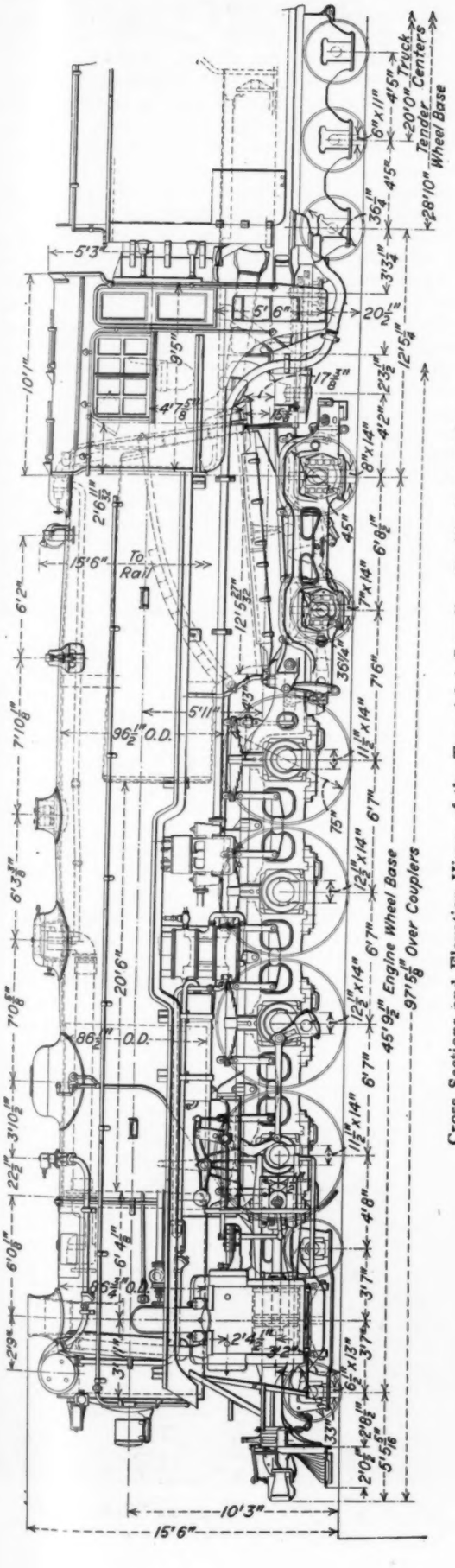
and is suspended by a toggle arrangement from the under side of the dome cover. This toggle arrangement is operated by a lateral screw running across the under side of the dome cover and operated by a hand crank from the outside. This design does away with any extensions above the top of the dome, giving a maximum dome height above the water level. A pilot valve is also provided with a lift of 3/8 in. which opens before the main plate valve. All of the valve and operating mechanism is assembled on the dome cover so that the cover and valve is removed and applied as a unit. The dome, in addition to being fitted with a shut-off valve, is also fitted with a filling valve.

A new feature used on these locomotives is the method of securing the arch tubes to the throat and door sheets. Nickel cast-steel ferrules are used which extend between the inner and outer sheets. The inner and outer ends of the ferrules screw into the inside and outside sheets; the ends project beyond the sheets and are welded in addition to being screwed into position. The body of the ferrule between the sheets is cast with six slots to allow circulation and the arch tube itself is expanded and rolled into the inner end of the ferrule in the usual way, there being an increase in the diameter of the ferrule immediately behind the inner sheet. The usual square-thread arch tube plugs are screwed into the outer end of the ferrules.

Alloy Steel Extensively Used

The locomotives are equipped with Commonwealth locomotive steel bed castings with which the bumper beams are cast integral. The cylinders are separate but are of cast steel. The combined assembly of cast-steel cylinders and locomotive bed casting has effected a weight saving of between 4,000 and 5,000 lb. Wheel centers and miscellaneous steel castings, such as pump brackets, guide yokes, piston-head centers, crosshead bodies, link support brackets, etc., are all cast nickel steel. The use of alloy steel for these parts has permitted a reduction in sections from 7/8 in. and one in. to 1/2 in. and 5/8 in. without any sacrifice of strength. The main and side rods and crank pins are of a low-carbon nickel steel to a new specification so that, taken altogether, there is probably more alloy steel used in the production of the K-1 class locomotives than has heretofore been used in any locomotives.





Cross Sections and Elevation Views of the Two 4-8-4 Canadian Pacific Locomotives

The engines are equipped with the American multiple-type front-end throttle which is operated by a throttle rod extending from the cam-shaft operating lever through the hand rail on the right side of the locomotive. Incidentally the hand rails, as well as the running-board outer edge angles, are of aluminum.

The Franklin tandem main-rod drive has been used experimentally on these two engines. They have also been fitted with both Spee-Dee and Alemite grease cups. Grisco driving boxes have been used on the main and intermediate journals. All boxes are fitted with Franklin spreader castings.

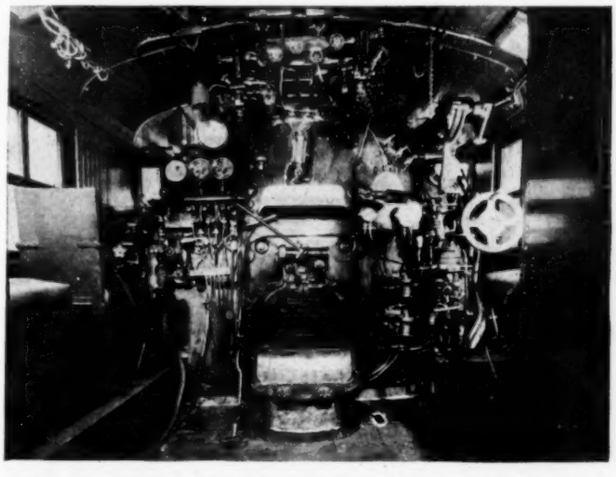
A New Design of Radial Buffer and Unit Safety Bar

A new design of radial buffer has been used between the engine and tender which consists of the usual buffer casting on the locomotive back deck casting and the customary floating wedge. The buffer block on the tender is held in position in the Commonwealth underframe casting laterally and vertically but is free to move endways. The back of this casting is of wedge shape. Two small floating wedges are provided which bear against the inner end of the floating tender buffer casting. Lateral pressure is exerted on these two small wedges by means of double coil springs on which the pressure can be released or increased by adjusting nuts. The whole scheme is somewhat similar to the Cardwell draft gear and provides greater flexibility in maintaining the correct wedge pressure between the engine and tender and also prevents crowding of the wedges in backing up which has a tendency to cause derailment.

The unit safety bar with which the locomotives are equipped is also of a new design. Up to the present the usual design was to have the drawbar and safety bar in contact at the engine end but separated from each other at the tender end which gave a sloping safety bar. In the new design the two bars lie flat one on the other, separated by wearing plates. This eliminates the angle safety bar and reduces the depth of the casting required on the tender.

Changes in Reverse Gear Design

The reverse gear is of the Canadian Pacific standard screw type and, on account of improvements made in cab construction, a new design has been provided where only the operating wheel and indicator are inside the cab. The operating screw is outside at running-board level immediately back of the tumbler shaft and is enclosed within a metal case. The connecting rod from



The Locomotives are Fitted with Spacious Vestibule Cabs

the operating wheel in the cab to the power screw is fitted with two universal joints.

The Cab Arrangement

The cab is of the vestibule type of steel construction insulated with hair felt. The inner finish is tongue-and-groove lumber. The cab itself is spacious, gives ample seating accommodation for three with a full length locker running from floor to roof, the upper portion of which is a clothes locker for the crew and the lower section a storage locker for accessories.

All valves, fittings and gages are carefully arranged for maximum convenience, one feature being that the valves and gages are mounted on two panels, one on the left and one on the right side of the back head. The gages and valves can be assembled in position on the panels which can be applied as units. By breaking pipe connections the panels can be removed intact.

Because of the long wheel base, the movement between the engine and tender is considerably greater than on previous Canadian Pacific locomotives equipped with vestibule cabs. This has led to a re-arrangement of the vestibule feature between the cab and tender. Instead of the usual apron plate reaching from the tender and moving sideways on the cab deck, a double apron is used. One apron is hinged on the back of the cab and rests on the tender and the other apron is hinged on the tender and supported by the apron plate that is hinged to the rear of the cab. In this way the top apron plate is kept off the cab deck which permits a narrower coal door back of the cab and permits greater side movement of the diaphragm which, as in past designs, is supported on the tender and is held against a wearing plate on the back of the cab by spring pressure.

Superheated steam is used for the operation of auxiliaries which include the whistle, air compressor, feed-water-heater pump, blower, dynamo, and stoker engine. The main supply line is led back at about running-board level from a shut-off valve and connection on the left side of the smokebox to a distributing turret on the left side of the cab immediately in front of the fireman. From this distributing turret leads are taken to the various auxiliaries as required.

Two lubricators are used, one five-feed Detroit hydrostatic lubricator for valve chests, cylinders and air compressor and a three-feed lubricator for the stoker engine and feed-water-heater pump; the third feed is capped. All superheated steam pipes exposed are covered with sponge felt and jacket lagging. Other distributing pipes are lagged with Johns Manville asbestos tape.

The locomotives are equipped with back-pressure gages.

The Tender

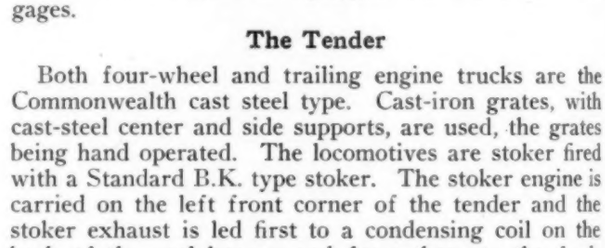
Both four-wheel and trailing engine trucks are the Commonwealth cast steel type. Cast-iron grates, with cast-steel center and side supports, are used, the grates being hand operated. The locomotives are stoker fired with a Standard B.K. type stoker. The stoker engine is carried on the left front corner of the tender and the stoker exhaust is led first to a condensing coil on the back of the coal hopper and from there to the feed-water heater oil separator into which the feed water heater condensate is discharged.

The tender is equipped with Commonwealth water-bottom cast-steel tender underframe and Commonwealth six-wheel trucks fitted with clasp brakes. The tender has a water capacity of 12,000 Imperial gallons and a coal capacity of 20 tons.

* * *

Table of Dimensions, Weights and Proportions of the C.P.R. 4-8-4 Type Passenger Locomotive

Railroad	Canadian Pacific
Type of locomotive	4-8-4
Service	Passenger
Cylinders, diameter and stroke	25½ in. by 30 in.
Valve gear, type	Walschaert
Valves, piston type, size	14 in.
Maximum travel	7 in.
Outside lap	1⅛ in.
Exhaust clearance	¼ in.
Lead in full gear	¼ in.
Weights in working order:	
On drivers	250,000 lb.
On front truck	61,000 lb.
On trailing truck	112,000 lb.
Total engine	423,000 lb.
Tender	286,000 lb.
Wheel base:	
Driving	19 ft. 9 in.
Rigid	19 ft. 9 in.
Total engine	45 ft. 9½ in.
Total engine and tender	87 ft. ¾ in.
Wheels, diameter outside tires:	
Driving	75 in.
Front truck	33 in.
Trailing truck	Front, 36 in., Rear, 45 in.
Journals, diameter and length:	
Driving, main	12½ in. by 14 in.
Driving, others	11½ in. by 14 in.
Front truck	6½ in. by 12 in.
Trailing truck	7 in. by 14 in., 8 in. by 14 in.
Boiler:	
Type	Conical
Steam pressure	275 lb.
Fuel, Kind	Bituminous
Diameter, first ring, inside	84¼ in.
Firebox, length and width	140 3/16 in. by 96 in.
Arch tubes, number and diameter	4, 3½ in.
Combustion chamber length	5 ft.
Tubes, number and diameter	59, 2¼ in.
Flues, number and diameter	203, 3½ in.
Length over tube sheets	20 ft. 6 in.
Grate area	93.5 sq. ft.
Heating surfaces:	
Firebox, comb. chamber and arch tubes	422 sq. ft.
Tubes and flues	4,509 sq. ft.
Total evaporative	4,931 sq. ft.
Superheating	2,112 sq. ft.
Comb. evaporative and superheating	7,043 sq. ft.
Special equipment:	
Superheater	Type E
Feedwater heater	Elesco
Stoker	Standard Type B. K.
Tender:	
Style	Rectangular
Water capacity	12,000 Imperial gal.
Fuel capacity	20 tons
General data estimated:	
Rated tractive force, 85 per cent	60,800 lb.
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent	.59
Weight on drivers ÷ tractive force	4.12
Total weight engine ÷ comb. heat. surface	60.1
Boiler proportions:	
Tractive force ÷ comb. heat. surface	9.65
Tractive force × dia. drivers ÷ comb. heat. surface	647
Firebox heat. surface ÷ grate area	4.51
Firebox heat. surface, per cent of evap. heat. surface	8.56
Superheat. surface, per cent of evap. heat. surface	42.8
Combined heating surface ÷ grate area	75.2



The D. L. & W.'s "Lackawanna Limited" Near Jersey City, N. J.

Hearing on New Express Plan

Interstate Commerce Commission hears application of 86 railroads for control of Railway Express Agency, Incorporated—Plan meets no opposition

WASHINGTON, D. C.

THE hearing on the application of the 86 principal railroads for authority to acquire control by stock ownership of the Railway Express Agency, Incorporated, which proposes to take over the property and business of the American Railway Express Company on March 1, and the application of the express agency for authority to issue approximately $32,000,000 of debentures for the purpose, was held on January 24 before Director C. D. Mahaffie of the Bureau of Finance of the Interstate Commerce Commission.

No opposition to the applications, which also ask approval by the commission of an operating agreement between the railways and the express agency, was developed at the hearing. The National Industrial Traffic League had intervened in the proceeding and its counsel, Luther M. Walter questioned W. B. Storey, president of the Atchison, Topeka & Santa Fe, who testified regarding the plan as chairman of the Uniform Express Contract Commmittee of the Association of Railway Executives. The answers appeared satisfactory to the league and it was announced that it did not desire to present testimony.

Short Lines Approve Plan

Bird M. Robinson, president of the American Short Line Railroad Association, expressed approval of the plan as being in the interest of the public as well as of the carriers and announced that the short lines would not intervene in the case after M. L. Bell of the legal committee representing the applicants, had read into the record an agreement that the execution of the operating agreement by the short lines shall be without prejudice to the right of any of them to apply to the commission for a change of divisions or to protect existing routing.

John E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, was interested in knowing whether the express agency proposed to assume liability for shippers' claims against the old express company, but, having been shown that the plan makes specific provision for such assumption he offered no objection and the case was submitted without briefs. It was stated that the details of the proposed issue of debentures would be submitted later, as the amount of the purchase price for the express properties, tentatively stated at $30,313,000, is subject to adjustment.

Separate applications were filed later for authority for railroad officers to serve also as directors and in some cases as vice-president of the express agency, as follows: W. B. Storey, president of the Atchison, Topeka & Santa Fe; P. E. Crowley, president of the New York Central; R. J. Cary, vice-president and general counsel of the New York Central; E. G. Buckland, chairman of the board of the New York, New Haven & Hartford; L. A. Downs, President Illinois Central; H. W. Clark, vice-president and general counsel of the Union Pacific; J. P. Blair, general counsel of the Southern Pacific; Charles Donnelly, president of the Northern Pacific; William H. Williams, chairman of the Missouri Pacific; M. L. Bell, vice-president and general counsel of the Chicago, Rock Island & Pacific; C. B. Heiserman, vice-president and general counsel of the Pennsylvania, and F. C. Nicodemus, Jr., assistant general counsel of the Wabash.

After describing the negotiations which resulted in the new plan for the conduct of the express business, Mr. Storey said that negotiation of a new contract with the American Railway Express Company would be open to two very serious objections. First, it would apparently be impossible wholly to overcome in any such contract the objections of the commission to the old contracts and at the most the roads might hope to reduce the express company's share of the net income and so mitigate the criticism. Second, the express company would undoubtedly insist upon a long-term contract. Criticisms of the present relationship of the railroads to the express company have been made by members of the commission, he said, on every occasion on which any phase of the express business has been brought before the commission during the past ten years.

"The object sought to be obtained by the plan entered into by the railroads," he said, "is to make the future express agency a railroad-owned joint facility engaging in express transportation in its own name but nevertheless acting in fact only as the agent of the railroad principals and accounting to them under the terms of the operating agreement for all of its revenues after payment of expenses. This arrangement will make the railroads transporters of express as they are of freight. We submit that this plan obviates the criticisms of the commission, or its members, of the past arrangements under which the express business of the country has been conducted and places the express business for the future on a sound basis."

Income to be Divided Among Roads

Mr. Storey said the provisions of Article V of the operating agreement differ in no substantial respect from those of the existing uniform express contract from the standpoint of the pooling feature. It withdraws from the income of the groups of carriers proposed 85 per cent of the gross revenue from carload traffic, which was included in the divided income under the 1920 contract. This amounts to only about $8,000,000 out of the gross express revenues of $300,000,000. On the other hand, the share of the net income which has heretofore been reserved for the compensation of the express company is left in the income for division among the railroads. The basis of the division is the proportion of the gross express revenue of the contract railroads, including, in the case of each railroad, first, the whole revenue from express traffic local to its lines, and, second, its share of the revenue on through express shipments in which it participates, pro-rated on the basis of the local first-class express rates per 100 pounds. This proportion is applied to the net income for the group resulting after the deduction from the whole group revenue of the expenses.

In other words, Mr. Storey said, the expenses are

dealt with on a group basis, since they cannot possibly be allocated to the several lines, and whatever pooling aspect is found in the arrangement results solely from the necessary treatment of expenses on a group basis. It is true, he continued, that there is no competition in express rates possible under this arrangement, but there has been no competition in rates during the period of operation of the American Railway Express Company.

Mr. Walter having in mind the broad charter powers of the company, asked if the company would be willing to stipulate that it would not engage in any business other than that which an express company generally performs, that there shall be no increase in rates by reason of the transfer, and that the company would subject itself to the jurisdiction of the commission in matters of service in the same manner that the service of the railroads is subject to its jurisdiction. Mr. Storey said he would have no objection but counsel declined to give specific answers as to the proposed stipulations until they had considered the matter more specifically, but it was stated that the new company proposes to adopt the tariffs of the old company and that no increase in rates is contemplated. So far as the public is concerned, Mr. Storey said, the intention of the railroads is to make a mere change in the name of the agency performing the service. The idea of purchasing the stock of the express company had been abandoned because of the impossibilty of obtaining all of it.

Vice-president Lutz Testifies

C. A. Lutz, vice-president in charge of accounts of the American Railway Express Company, testified that no substantial change in the accounting would be required by the transfer, but that it was not expected that the express agency would have any considerable amount of net income, unless for an appropriation for sinking fund purposes, and that the average amount to be distributed to the railroads would be about $135,000,000 a year. He outlined the method by which the purchase price was ascertained, on the basis of cost, less depreciation, of the buildings and equipment, as of February 28, and the materials and supplies as of their book value on that date. The tentative figure, based on estimates, is subject to later readjustment. Corwin Black, general manager of the real estate department of the express company, and G. W. Lamb, general auditor for the Express Contract Committee, also testified as to the checking of appraisals.

It was stated by counsel that the plan had been approved by all but 5 of the 86 participating railroads and that all but one of these is in process of approving the plan.

Plan Accepted As Only Solution

Bird M. Robinson said that at first some of the short lines were not satisfied with the plan because it shut them out as participants in the stock ownership, but when it was ascertained that 350 of them handle only 2 per cent of the express business it was seen that the amount of stock to which any of them might be entitled would be infinitesimal. At a recent special meeting of the short lines some apprehension had been expressed that the stockholders in control of the express agency might divert business from some of the short lines and he had been intrusted to ask the commission to reserve the right to prescribe joint rates and protect existing routing. As to the general proposition he said the plan is the only feasible one that has been suggested and after Mr. Bell had read the agreement acknowledging the proposed contract to be necessarily subject to the regulatory powers of the commission he said the short lines are willing to accept it and would not intervene.

While it was deemed impracticable to extend to the short lines participation in the ownership of the capital stock of the operating company they have been given the opportunity to participate in the standard form of operating agreement equally with the participating roads.

Bonds of Express Agency Offered to Public

The initial offering of securities of the Railway Express Agency, Inc., was made on January 29 when $32,000,000 in bonds were issued to the public through J. P. Morgan & Co., Kuhn, Loeb & Co., the First National Bank and the National City Company.

The announcement of the issue stated that the Railway Express Agency, Inc., has been incorporated under the laws of Delaware to carry on the express business as agent of the 86 participating roads over which 95 per cent of the country's express traffic moves. It further said that the new corporation has contracted to purchase the equipment and physical properties of the American Railway Express Company, to which end, and to that of providing working capital, it will devote the proceeds of the bond sale. The plan of the railways to take over the assets and business of the express company was published in the *Railway Age* of July 21, 1928, page 116.

Control to Remain With Carriers

Control of the new corporation is to remain with the participating carriers under the stock allotment plan which assigns, to each road, a number of voting shares, bearing the same proportion to the total shares as did the express business of each to the total of all participating lines, the percentage being computed with an average of the 1923, 1924, 1925 and 1926 business as a base. The number of these shares was fixed at 1,000 and the allotment plan gives the New York Central and the Pennsylvania the largest numbers with 144 and 126 respectively. Allotments assigned to each of the participating carriers were published in the *Railway Age* of July 28, 1928, page 168.

The Railway Express Agency, Inc., has exclusive right to the express business of the participating railways, subject to certain exceptions in the case of carload traffic, from February 28, 1929, when the present uniform contract expires, until February 28, 1954.

The letter in connection with the bond issue was signed by W. B. Storey, president of the Atchison, Topeka & Santa Fe; W. W. Atterbury, president of the Pennsylvania; Patrick E. Crowley, president of the New York Central; and Carl R. Gray, president of the Union Pacific, who have acted as agents of the participating roads throughout the negotiations.

The bonds, designated as five per cent serial gold bonds, are offered at 100 and interest, "subject to any necessary approval by the Interstate Commerce Commission of the various steps involved in the transaction and to approval by counsel of the legality of the issue and of the form and validity of related documents and proceedings."

All Kinds of Food Preparation Are Taught in the Experimental Kitchen

Pennsylvania's Dining Car Schools Lower Cost of Meals

Instruction given to improve service has also increased interest among employees

THE Pennsylvania's training schools and experimental kitchens for its dining car stewards, cooks and waiters, one of which was opened at Columbus, Ohio on July 6, 1927, another at Chicago on March 1, 1928 and the third at New York on July 6, 1928, mark the progress of this road in its program, which was started last year, to improve its dining car service by the proper training of employees and a more efficient selection of foods. The commissary at Chicago, since its inception, has reduced the average cost per meal served to $1.48, compared with $1.54 during the same period of 1927. This represents an aggregate saving of $7,200 on 120,000 meals served per month. The average amount paid by the patron for one of these meals has been the same during both periods, namely $1.22. In addition, the discipline and conduct of employees has been perfected while their interest in the work has increased.

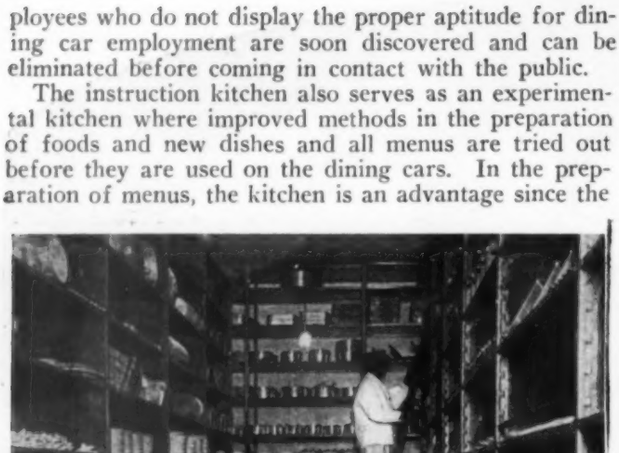
The experimental kitchen and training school at the Chicago commissary, has the same objectives as the two older schools: to give a thorough and rigid training to new dining car employees and, at the same time, by regular periods of study and instruction, constantly to improve the work of those already in service. To make this possible, an exact reproduction in space and equipment, of the latest type Pennsylvania dining car, built into and forming a part of the commissary building, is used for demonstrations and experiments. Every feature, from cooking utensils, range, broiler and pantry, to the dining room and table for patrons, has been reproduced accurately. Even the familiar aisles and corridors have been retained and made to conform exactly with standard dining car specifications. With this complete and compact equipment it is possible to carry on demonstrations and conduct classes under exactly the same conditions as prevail in cooking and serving meals while dining cars are under way.

Every feature of the cooking art is taught with great care. The instruction ranges from the preparation of cuts of meats for broiling and roasting to the creation of the most delicate sauces and salads. The courses of instruction cover the preparation of raw meat cuts, poultry of all kinds, fish, soup stock, sauces, eggs, vegetables, cold meats and garnishings, salads and relishes, hot breads, puddings, pastries, beverages, and many other fundamentals of the culinary art. Training in preparing and serving all dishes is given new men as well as older employees and new ideas are presented constantly. The average employee spends approximately three hours at school each week, while assigned to his regular run. At intervals, each employee is detailed to the school for a week or more of intensive training. With this arrangement it is possible for the superintendent to have personal contact with his entire road force within a period of three days.

Instruction to stewards, chefs and waiters is given in the replica of the dining car, the pupils occupying seats outside of the working space. As the instructor proceeds, he calls upon a pupil to answer a question or to enter the kitchen and proceed with the work being undertaken. Each instructor keeps track of the progress made by each individual and, if in his opinion, the work is not satisfactory, he can extend the pupil's period of training. With this procedure, new em-

ployees who do not display the proper aptitude for dining car employment are soon discovered and can be eliminated before coming in contact with the public.

The instruction kitchen also serves as an experimental kitchen where improved methods in the preparation of foods and new dishes and all menus are tried out before they are used on the dining cars. In the preparation of menus, the kitchen is an advantage since the



The Crockery Room Contains Enough Utensils to Furnish a Hotel

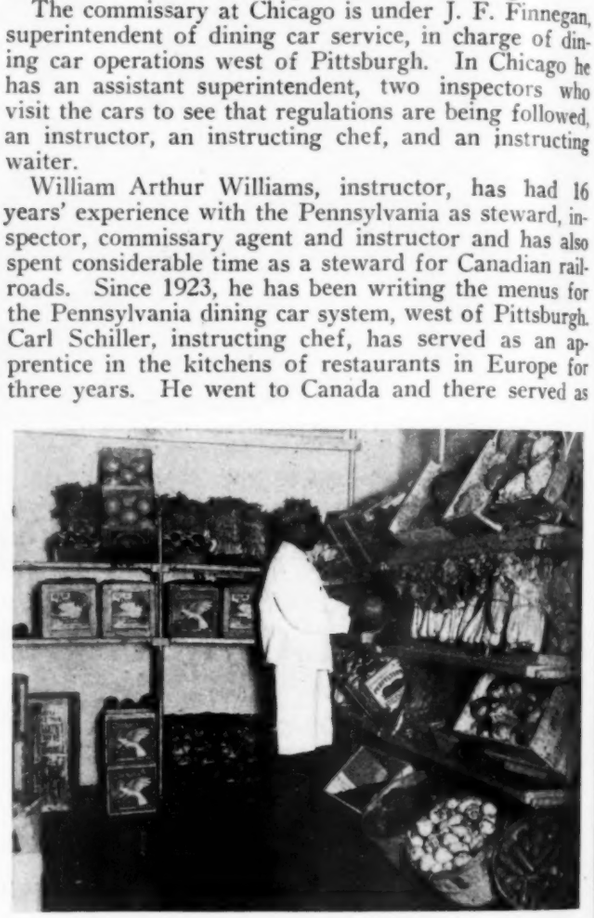
items selected can be made therein and the possibility of choosing dishes, the preparation of which is cumbersome on a dining car, is avoided.

Menus Arranged With Care

In arranging menus, several factors are considered. These include the public's taste, the facilities of the car, seasonal foods, food values and combinations, styles in foods, and artistic display. Only fresh vegetables are used the year round. A single menu, of which 45,000 copies are used, is served on all cars for a week. This is made possible by including such a variety that a person using the dining car several successive days is not forced to eat the same food each day. A study of the habits of the patrons has shown a preference for a table d' hote meal rather than a la carte. About 75 per cent of the people will order the special meal rather than to choose individual dishes for themselves. As a result the Pennsylvania is specializing in table d' hote service but emphasizes the fact that the car is equipped to prepare any dish within reason. Standard menus to cover a period of four weeks are issued in advance and these are accompanied by detailed instructions for preparation and serving.

The commissary at Chicago is under J. F. Finnegan, superintendent of dining car service, in charge of dining car operations west of Pittsburgh. In Chicago he has an assistant superintendent, two inspectors who visit the cars to see that regulations are being followed, an instructor, an instructing chef, and an instructing waiter.

William Arthur Williams, instructor, has had 16 years' experience with the Pennsylvania as steward, inspector, commissary agent and instructor and has also spent considerable time as a steward for Canadian railroads. Since 1923, he has been writing the menus for the Pennsylvania dining car system, west of Pittsburgh. Carl Schiller, instructing chef, has served as an apprentice in the kitchens of restaurants in Europe for three years. He went to Canada and there served as



Vegetables Are Kept Fresh in Refrigerator with 40 Deg. Temperature

chef for the Nasmith Company, who operated a chain of restaurants in Toronto. Later, he was chef of the King Edward Hotel of Toronto and chef de cuisine of the Royal Canadian Yacht Club. For four years he was assistant chief steward on the S. S. "Lusitania",

Employees Are Given Instruction in Commissary Building at Chicago

S. S. "Carpathia" and S. S. "Mauretania." Walter Jack, the instructing waiter, has been in the service of the Pennsylvania for five years and has had much experience in hotel and catering work, including service at the Palmer House, Chicago.

Another feature of the commissary at Chicago is the method of recording the assignments of men to cars. A large board, 5 ft. by 6 ft. is located in the general office room of the commissary building and on it are hung the names of the men in horizontal rows opposite the car number. A brass tag, with a hole for a hook, contains the paper bearing the man's name. The card for each class of employee bears a distinct color, white, green, blue, and yellow being used.

The importance of a standardized dining car service is realized after considering the factors involved. The Pennsylvania now operates 183 cars on over 200 trains a day. In 1927 an average of 12,000 meals per day or 4,000,000 per year were served. Nearly 2,000 persons are employed in the dining car department, including stewards, waiters, cooks, commissary workers, clerks and a large group of miscellaneous employees.

In 1927, approximately 2,000,000 lb. of meat and fowl were served. Patrons were also served 300,000 lb. of fish, 150,000 lb. of white potatoes, 450,000 loaves of bread, 160,000 doz. of rolls, 225,000 lb. of butter, 230,000 doz. eggs, and 220,000 lb. of coffee and tea. A single dining car demands 16 large baskets of supplies, and this does not include the perishables that are picked up at different dining car agencies located in the larger terminals.

Every day, 15,000 napkins, 2,500 table cloths, and 1,400 waiters' jackets are freshly laundered for use on the cars. More than 3,000 articles are used in the preparation and service of meals on one diner. At one commissary there are enough dishes to stock a large metropolitan hotel, while storerooms house reserve supplies of pots and pans and various other utensils.

A Pennsylvania diner carries about 1,200 pieces of linen, 750 pieces of silverware, and 1,500 pieces of china and crockery. The total cost of one dining car's equipment runs well over $3,500. The dining car department's laundry bill alone amounts to about $18,000 each month.

The facilities of the commissary department at Chicago are housed in a new one-story and a basement brick building, 160 ft. by 60 ft., so constructed that additional floors may be added. One end of the building is occupied by the offices of the officers and the clerical employees and the kitchen. The central portion contains the refrigerators, silver vault, and crockery room while the third portion includes the linen room, linen repair room, grocery room and order filling room. The basement, which is served by a hydraulic elevator, contains storage space and the machines for the refrigerators. Mechanical refrigeration is used for the storage of perishables. The box is of special construction and is divided into four 10-ft. by 15-ft. sections, one of which contains vegetables and fruits, another meats, the third dairy products and the fourth fish foods. Seven machines with a capacity equivalent to 5,000 lb. of ice per 24 hours, are used to cool the refrigerator, but the actual requirement under normal conditions is equivalent to about 1,000 lb. of ice per 24 hours. With the exception of the vegetable compartment, each section is cooled by two units.

The silver vault is 4 ft. by 5 ft. and the crockery room is 20 ft. by 12 ft. The grocery room is 40 ft. by 30 ft. and contains an order-filling counter 20 ft. by 4 ft. These rooms are equipped with steel shelving.

The linen room, 60 ft. by 35 ft., contains wooden lockers in which are stored all cloth material used in the service. Adjacent to this is the repair room, 12 ft. square, in which a seamstress mends materials.

* * * *

An Airplane Photograph of the Central Railway Station at Leipzig, Germany

No Undue Diversion of Commerce to Canadian Ports

WASHINGTON, D. C.

NO occasion for alarm as to diversion of commerce from ports of the United States to Canadian ports, nor maladjustment of freight rates tending in that direction, are found by the Secretary of State, the Secretary of Agriculture and the Interstate Commerce Commission in a report in response to a resolution introduced in the Senate last year by Senator Walsh of Massachusetts. The report was transmitted to the Senate on January 29 by the President.

"The extent to which diversion of commerce from American ports to Canadian ports may be held to exist depends largely upon the point of view and the criteria adopted," the report says. "The difficulties presented in reaching a conclusion on this subject are suggested by the fact that the concern felt in Canada over 'diversion' of commerce to American ports has been fully as serious as the concern which has manifested itself in the United States over the 'diversion' of commerce from American ports to those of Canada. . . . .

"On the basis of the value of Canadian commerce handled by American ports and the share of the total commerce of Canada obtained by ports of the United States in the years 1919 to 1928, it appears that the position of American ports has materially improved during this period. Not only is their position in 1928 superior to that in 1919, both on the basis of the absolute value and the proportion of Canada's commerce obtained, but taking the period as a whole, there is a perceptible tendency toward improvement in their position.

Silk Imports Valuable

"In the year ended March 31, 1928, Canadian ports obtained 375 million dollars worth of American commerce while American ports obtained only 304 million dollars worth of Canada's trade. Although the situation of American ports is not inferior on this basis to that existing in the years 1921 to 1923, the fact that the value of American commerce obtained by Canadian ports exceeds in value the Canadian commerce obtained by American ports might be taken as an indication that the latter are not obtaining their due share of traffic. However, two considerations should be noted in this connection. In the first place, a large part of the American traffic obtained by Canadian ports consists of raw silk imported into the United States via Vancouver. . . . . In the second place, the fact that the amount of American commerce handled by Canadian ports has been materially greater, when expressed in dollars, than the amount of Canadian commerce handled by American ports, may be attributed to the fact that the volume of American trade to be handled is several times as large as that of Canada. A comparison of the percentages of the total commerce of each country handled by the ports of the other shows that in the year ended March 31, 1928, Canadian ports, obtained only 4.8 per cent of the total trade of the United States with countries other than Canada while American ports obtained 26.6 per cent of the trade of Canada with countries other than the United States. . . .

"On the whole available data with respect to the movement of traffic through the ports of Canada and the United States, do not seem to afford ground for apprehension concerning the welfare of American ports and transportation agencies. . . . . The situation insofar as movement of Canadian export traffic is concerned appears to be distinctly favorable to American ports. During the ten-year period, 1919 to 1928, there is a distinct trend in their favor, the total value of Canadian exports handled by American ports, as well as the proportion of Canada's total overseas traffic obtained by them, having greatly increased. . . .

"From a consideration of the total export traffic of the United States and Canada there appears on the basis of available statistics to be nothing to indicate any undue diversion of traffic from American to Canadian ports. On the whole, in fact, the situation as respects export traffic seems distinctly favorable to the ports of the United States. . . .

"The average annual exports of American grain from Canadian ports during the past five years have amounted to approximately 53,000,000 bushels, according to the official elevator returns published by the Canadian government. . . . The average annual exports of all Canadian grains from north Atlantic ports during the past five years have amounted to 135,296,000 bushels, while the average annual exports of wheat alone have amounted to 106,128,000 bushels, or approximately 56 per cent of the annual average exports of Canadian wheat to overseas countries from the Atlantic seaboard. . . . It is important to note that the bulk of the grain that is exported from the port of New York, as well as Boston and Portland, Me., is of Canadian origin."

Following a discussion of the railroad rates situation, the report says: "We find nothing in the general export class or commodity rate structure to north Atlantic ports to warrant the conclusion that such rate structure is of a nature to cause diversion of traffic to Canadian ports. . . . nor do we find anything in the existing rate structure to Pacific ports which would tend to divert any American grain to Canadian Pacific coast ports. . . . There is nothing to show that the existing all-rail rate structure to Atlantic ports is causing any diversion of American grain to Canadian ports."

"It may be concluded," says the report, "that such advantage as Canadian ports enjoy over American ports in competition for export traffic is confined to St. Lawrence ports, principally Montreal, and to traffic represented by a limited number of products, principally grain. This advantage, which consists in geographic advantages arising from the existence of a cheap, workable all-water route, rather than from any apparent maladjustment of transportation rates, appears to be entirely counterbalanced by the geographic handicap of the closed season on the St. Lawrence and by certain advantages enjoyed by American ports in the matter of ocean freight rates and services and marine insurance rates."

Shipping Board Disagrees

The Shipping Board declined to join in the report but submitted a separate report disagreeing with many of the conclusions. "While we do not regard the reasons for the diversion as cause for apprehension in the sense that they seriously threaten the future growth and prosperity of American ports," it said, "we think that their growth and development will be more rapid if the diversion of American commerce through foreign ports is minimized, and such commerce, as far as practicable, routed by American rails through American ports." The Shipping Board finds diversion of traffic to be due to railroad rates, grain inspection, preferential customs regulations of Canada and preferential schedules of other parts of the British Empire.

New York Central Unification Found in Public Interest

Condition imposed that Central shall offer to acquire six short lines at commercial value

WASHINGTON, D. C.

UNIFICATION of the New York Central Lines, through 99-year leases to the New York Central Railroad of the properties of the Cleveland, Cincinnati, Chicago & St. Louis and the Michigan Central and subsidiary or affiliated companies now controlled through stock ownership, making a total mileage of 11,507 miles of main line, is found by the Interstate Commerce Commission to be in the public interest, in a report made public on January 26, (dated January 14), on condition that the New York Central shall offer to acquire the lines of six short line companies "for considerations equal to the commercial value of the respective properties." Pending the negotiations the record in the case will be held open for six months and the entry of an order of authorization and approval will be deferred until compliance with the condition has been shown "by proper proof of all pertinent facts relating to the communication of said offers to the short lines concerned, the course and details of negotiations had thereon, and final acceptance or rejection, as the case may be, of said offers by the respective short lines."

Commissioners Eastman, McManamy and Taylor Dissent

Specifically the report finds to be in the public interest, subject to the condition, the acquisition by the Big Four of control under lease of the railroad properties of the Cincinnati Northern and Evansville, Indianapolis & Terre Haute, the acquisition by the New York Central of control, by lease, of the railroad system of the Big Four including all right, title and interest in the properties of the C. N. and E. I. & T. H., the Peoria & Eastern and the Kankakee & Seneca, and also of the Michigan Central and of the Chicago, Kalamazoo & Saginaw. The proposed leases provide for the payment as rental of 5 per cent on Big Four preferred stock, 10 per cent on its common stock, 50 per cent on Michigan Central stock, and 12, 6 and 4 per cent respectively on stock of the C. N., Kalamazoo and Terre Haute companies, except stock owned by the lessee. After a detailed consideration of objections made by representatives of minority stockholders to these terms the commission finds that "the provisions of the proposed leases for the purchase of minority stock at values determined by bona fide arbitration appear to furnish adequate means for equitable adjustment of grievances of dissatisfied minority stockholders."

The short lines to which offers must be made are the Boyne City, Gaylord & Alpena, the Chicago, Attica & Southern, the Federal Valley, the steam railroad of the Fonda, Johnstown & Gloversville, the southern segment of the Owasco River and the Ulster & Delaware. The commercial value is to be as determined by agreement between the parties, or by arbitration in the manner prescribed in the leases for valuation of the minority shares of the lessors, and hereafter approved by the commission. The right to determine bona fide compliance with the condition is expressly reserved in the commission and acceptance of and compliance with the conditions "shall not be interpreted as relieving the New York Central from the further operation of the law respecting consolidations or as excusing that carrier from further responsibility for the representation made on its behalf that on appropriate occasion for considering the inclusion of so-called short line railroads, these matters will be approached by the New York Central in a spirit of co-operation looking to their solution with all due regard to the public interest."

Non-Intervening Short Lines Not Considered

The commission finds that the preservation of the short lines referred to "is required by public convenience and necessity for the maintenance of an adequate transportation system, as conceived and provided for by the transportation act, and that they are shown to be complementary to and properly apportionable to the New York Central system." The commission finds no basis for the allocation of the Casey & Kansas and Kansas & Sidell to the New York Central Lines; that the case of the Delaware & Northern may be dismissed from further consideration unless and until the matter of the unification of the properties of the Ulster & Delaware, with which it connects, with the New York Central system approaches consummation, and that the indicated flow of traffic does not impress it that the line of the Southern New York should be considered primarily a feeder of the New York Central Lines. As to 62 short-line carriers connecting with the New York Central which did not intervene in the proceedings, the commission assumes that they and the public served by them are content, for the present at least, with existing conditions, and they were dismissed from further consideration at this time.

In order to give effect to the intention of Congress, the report says, "it is essential that remedies calculated to avoid loss of transportation facilities be applied where and as possible" and that "with respect to these remedies we have heretofore said that union of weak with strong lines is one of the ends which Congress had most definitely in mind and given notice that every carrier proposing unification of railroad properties in advance of eventual consolidation should assume the burden of making reasonable provision in its plan for the possible incorporation of connecting short lines unless omission from the plan or abandonment of any such line or lines be justified.

The applications on which the commission has issued this report were filed on July 29, 1926, and after hearings a proposed report by an examiner was made public recommending that they be not granted until provision had been made for the inclusion of connecting short lines. The relevancy of testimony on behalf of the intervening short lines in support of their contention that

the applications should be denied unless they were included was contested by the New York Central but at a further hearing it presented data regarding the situation of each line and asked that the short line interventions be dismissed.

Extracts from the text of the report are as follows:

Request is made in both applications for authority under any and all other pertinent provisions of the interstate commerce act to enter into the proposed indentures of lease, to exercise the rights therein granted, and to assume and carry out the obligations and agreements therein contained. The record contains no further reference to these requests. Manifestly they lack sufficient particularity to present any definite matter for our consideration. Responsibility for obtaining all authority necessary in the premises must remain with the applicants.

Mileage

The following statement is a recapitulation of testimony as to operated main-line mileage involved in the unification proposed herein:

Owned and leased lines:	Miles
New York Central	6,376.89
Big Four	2,220.85
Michigan Central	1,762.30
Kalamazoo	55.35
Cincinnati Northern	205.14
Terre Haute	139.77
Total	10,760.30
Lines operated under trackage rights	747.51
Grand total	11,507.81

Including second, third, and fourth main-line tracks, yard tracks, and sidings, there are involved in the proposals 26,090.38 miles of track, of which 1,244.54 miles are used under trackage agreements.

Traffic Relationships

The Big Four has a peculiar value to the New York Central Lines. Big Four system lines traverse territory in Ohio, Indiana, and Illinois which is well settled, has diversified industries, and is growing. The lines of the Big Four in these important industrial and agricultural sections of the Middle West, in connection with the main stem of the New York Central, afford transportation facilities between that territory and the Atlantic seaboard, and by reaching Ohio, Mississippi, and Illinois River crossings, extend the New York Central Lines to connections with the South, Southwest, and West. The Big Four originates coal in Illinois and, through the Cincinnati gateway, handles Kentucky and West Virginia coal, which moves in system interchange to New York Central and Michigan Central territories.

With reference to the Michigan Central and New York Central lines which traverse opposite shores of Lake Erie, it is stated that by reason of switching absorption tariffs through traffic may originate at the same points and receive the same deliveries via either line. Through traffic in both directions comprises about 10 per cent of the total traffic handled by the lines. The movement eastbound predominates and this traffic converges at Buffalo, from which point the New York Central's main stem affords the only system route to the Atlantic seaboard. At the Niagara frontier the New York Central interchanges with the Michigan Central through traffic destined to points west and northwest of Lake Erie, and retains for movement over its own lines through traffic (not otherwise routed by shippers) destined to points south and southwest of the lake. Through traffic to or from Chicago and points west may be routed by the shipper, at the same rates, over the line of the Michigan Central or over the New York Central's Chicago-Buffalo line. With respect to the industrial territory of southern Michigan, widely served by both carriers, it appears that the New York Central, in conjunction with the Big Four, handles coal and raw materials inbound, while the Michigan Central originates the finished products of manufacture. It is contended that the lines of the Michigan Central and the New York Central are essentially complementary, and that this complementary relationship under common control has continued, with advantage to the public, for nearly 50 years.

Carrier companies involved in the proposal of the New York Central are now controlled, directly or indirectly, by that company as indicated in the following tabulation of stock ownership.

Company	Par value outstanding*	Owned by New York Central or a subsidiary company: Par value	Per cent	Owned by minority interests: Par value	Per cent
Big Four:					
Common stock	$47,028,700	$42,941,100	91.31	$4,087,600c	8.69
Preferred stock	9,998,500	8,468,100	84.69	1,530,400	15.31
Michigan Central	18,736,400	18,584,100	99.19	152,300	0.81
Kalamazoo	450,000	180,000 a270,000	100.00	.....	....
Cincinnati Northern	3,000,000	b2,931,600	97.72	68,400	2.28
Terre Haute	4,290,000	b4,290,000	100.00	.....	....

* All shares of the par value of $100.
a Owned by the Michigan Central.
b Owned by the Big Four.
c Of which $2,360,900 is represented by the protective committee.

Common executives serve both the New York Central and the subsidiary companies, the parent company and the subsidiaries also having interlocking directors. While the boards are not identical in personnel, 13 of the 15 directors serving the Big Four and the Michigan Central also serve the New York Central in similar capacities.

Issues raised by the proposals of the applicants and the contentions of interveners relate generally to the test of public interest prescribed by the statute, to terms and conditions of the proposed leases, and to our jurisdiction under the provisions of law invoked.

Reasons Urged in Support of Proposals

On behalf of the applicants it is contended that the New York Central Lines have been built up with a view to a properly coordinated system. The opinon was expressed in the testimony that the leases are steps leading in the direction of consolidation.

In practice it is expected to maintain existing routes and to comply with routes designated by shippers, but it is hoped that arrangements ultimately may be worked out with the shippers, with our approval, and with foreign connections, which will afford freedom of operation as to the routing of freight and thereby promote better and more economical service. In the testimony, advantages expected to accrue to the public are approached from the viewpoints of traffic, transportation, accounting, and maintenance of equipment.

1. Revision of routes, both within the system and interline, has been hampered by a proper regard for minority interests. The proposed leases would eliminate objection, on that score, to the short-hauling of lessor lines. Any changes with respect to internal routes and interchange gateways would be made subject to approval by us, the shipping and traveling public, and foreign connecting lines. Considering the large amount of mileage which would be under single operating control, the volume of traffic, and the possibility of using alternate routes, it is thought that substantial improvements may be made. Shorter routes should lower transportation costs and increase net earnings, but no estimate of definite results is ventured.

There are at present three major traffic departments for the lines involved. Each of the traffic departments is to be maintained, with no change in tariff and rate jurisdiction. Michigan Central-New York Central, lessee, and Big Four-New York Central, lessee, are to be used as trade names. Under single operation, rates of the several traffic units are to be interchangeable so that it will be possible to improve routings of traffic. No routes desired by the public are to be closed, but, in the absence of contrary shipping instructions, the most efficient will be considered the regular routes. Freight will be solicited for movement over the most economical routes, the unit obtaining the traffic to get credit for the traffic regardless of the route over which it is forwarded. The cost of solicitation will remain substantially the same as at present. If shorter routes are used as freely as anticipated the resultant saving in mileage will be quite large. Diversion of traffic from longer routes is not, generally speaking, to interfere with local service. It is not expected that all the traffic will necessarily take the shorter routes.

2. Possible new routes, graphically illustrated in the record, are practicable operating routes and can be used advantageously for the transportation of traffic. Most of them are available for use at present, but in some instances physical improvement would be necessary were a large volume of traffic diverted to such routes. In March, 1927, a study was made of traffic moving through certain gateways, during a period of 10 days, for the purpose of determining the approximate volume of such traffic capable of movement via more direct routes and the saving in mileage which might be effected by rerouting. It appeared from this study that approximately 6½ per cent of the cars passing through the particular terminals could have moved, under other circumstances, by shorter routes. Upon the assumption that the period selected was fairly typical, an adjustment of the results of the study to an annual basis showed a potential aggregate saving of 11,796,789 car-miles per year through direct routing. Applying car-mile costs to this possible saving, the decrease in transportation expenses would amount to approximately $1,000,000 annually. The fig-

ures submitted are merely indicative of possibilities, but the amount stated is claimed to be probably an underestimate of what might be done.

Unified operation as proposed would also tend to reduce yard movements and terminal switching now required, to permit the routing of freight away from congested terminals, and to bring about better train building. At points common to lines of two or more of the companies terminal operations are conducted on a contractual basis which involves intricate and accurate accounting and which is subject to change with changing conditions of various kinds.

From the transportation viewpoint, benefits of the proposals of the applicants are summarized as follows: Savings in car miles, affecting time in transit and deliveries; a better car supply, through expeditious movement of traffic; and substantial economies in the cost of operation through more effectual train grouping, reduced yard operations, and elimination of duplicated effort and simplification of accounting at common terminal points. No estimate has been furnished as to amounts of money which may thus be saved for the stated reason that the matter is so complicated that any attempt to make an estimate would be open to serious question as to the accuracy of the result.

3. Operation of the various lines as a unit would permit the adoption of a unified accounting system adapted to the needs of the organization as a whole, as contrasted with exact accounting now required for each company. Economies could be affected by the substitution of arbitrary charges for detailed accounting required in the matter of joint facilities and by the simplification or elimination of records, reports, billing, correspondence, etc., incident to the exchange of equipment, equipment repairs, interline freight and passenger traffic, and joint expenses. The applicants' witness was confident that substantial economies in accounting would follow unified operation, but explained that, in his opinion, economies do not always means a cash saving, but sometimes afford the opportunity of getting more service for the same money.

4. The major advantage of the proposed leases from the viewpoint of the repair of equipment would be in relation to main shops where general repairs are handled. It appears that main-shop facilities are generally adequate except at West Albany, N. Y. and Collinwood, Ohio, on the New York Central, and at West Detroit, Mich., on the Michigan Central, where extensions estimated to cost $7,000,000 are in contemplation. Through use of facilities available on the Big Four these expenditures can be indefinitely deferred, with a resulting saving in carrying charges. Other economies may be effected by the combination or closing of some smaller shops, and for the future it would be beneficial to consider any extensions or replacements of existing facilities from the viewpoint of a unit rather than from that of two or three carriers. Unified operation of the lines would permit increased flexibility in the repair of equipment and would facilitate the transfer of locomotives from one line to another for transportation purposes.

The Short Lines

The applicants have undertaken to furnish information concerning the general short-line situation. Including lines not exceeding 500 miles, but excluding lines owned, controlled, or operated as parts of general railroad systems, it is stated that there are 71 short-line railroads which connect with the New York Central Lines. Of these railroads, 9 are represented by interveners herein, leaving 62 which have not intervened or had any part in this proceeding. The latter are classified as follows:

	Power		
	Steam	Electricity*	Total
Affiliated with or controlled by industries	32	5	37
Independent of industrial affiliation or control	14	11	25
Total	46	16	62
Aggregate mileage	2,045.30	2,016.54	**4,061.84

* Wholly or in part.
** Affiliated with or controlled by industries, 1,593.78 miles.

Public Interest

The applicants contend that control of the lessor lines under lease, as proposed, would be in the public interest because the proposed leases are a natural step in the evolution of the New York Central Lines and because of advantages expected or hoped to accompany unified operation. On behalf of the short lines it is replied that the applicants made no material showing in the record of public gain to result from their proposals, but presented testimony, hedged about with qualifications, as to possible incidental opportunities for internal economies which might be expected to follow in any case, and have entirely ignored major considerations with which the public is primarily concerned. Thus, it is contended, the applicants have failed to sustain the burden of proof.

The short lines point out that the applicants are seeking to take an important step in the direction of complete consolidation of the properties which it now controls, and that the only remaining step necessary to be taken is one which would change at most only the legal and technical status of the companies. The New York Central system would be so thoroughly integrated, the unification of the lines would be so complete, it is contended, that little incentive would remain for the taking of further steps and, under the present state of the law, no means are provided to compel the applicants to consolidate or to propose consolidation.

Since this proceeding relates merely to the lease of properties which are already part of the New York Central Lines and does not involve the building up of a large system the applicants contend that this is not an appropriate occasion for considering the inclusion of any so-called short-line railroads. On brief, but nowhere in the testimony, it is stated that when appropriate occasion arises for the consideration of these questions, they will be approached by the New York Central in a spirit of cooperation looking to their proper solution with all due regard to the public interest. But, the short lines reply, the distinction is one of degree and not of principle, and there is no suggestion in the terms of the statute of any distinction of the kind claimed by the applicants. The Ohio interests apprehend that the appropriate occasion for considering the question of including short lines may not arise for 99 years.

The short lines ask that the pending applications be denied, or if the authority sought is granted, that conditions be imposed requiring the applicants to make provision for the incorporation in the unified system, upon reasonable terms, of short lines party hereto. Two of these interveners suggest, as a third alternative, that the record be held open for a reasonable length of time to afford the applicants opportunity to amend their applications so as to provide for the inclusion of appropriate short-line railroads. As an alternative in the case of the Owasco, it is requested that we enter a conditional order similar to that in *Control of Gulf & Ship Island R. R., supra.*

The applicants, on the other hand, ask that the short-line interventions be dismissed upon one or more of the following grounds: That interventions not for the purpose of preventing adoption of the plan, but for the purpose of requiring further extension of the plan, are not permissible under the provisions of paragraph (2) of section 5; that we may not condition our approval herein upon the making or offering to make acquisitions of control other and different than those proposed by the applicants; that the short lines have failed to produce adequate data upon which we may find that the public interest requires allocation of their lines to the New York Central system; and that the interveners have failed to furnish adequate data upon which we may prescribe terms and conditions upon which their lines should be included in the proposed unification plan. If these findings are refused as to any short line, and we find that such intervener's properties should be included in the unified system, then the applicants ask that we prescribe the terms and conditions upon which the properties should be included.

Dissenting Opinions

Commissioner Eastman dissented on the ground that what is proposed is beyond the scope of the commission's jurisdiction under paragraph 2 of section 5. He also objected to the payment of 50 per cent dividends annually upon the stock of the Michigan Central and because, as he said, the decision contains no recognition of the principle that "all that the public should be required to pay the private owners of railroad and other public utility properties is sufficient compensation to insure faithful and efficient performance of the public service, including the supply of capital necessary to the extension of the service."

Commissioner McManamy also held that the proposal amounts to a consolidation and said it had not been shown to be in the public interest and that complete disregard had been shown for the welfare of the short-line connections. If the proposed economies are practical, he asked, "why have they not long ago been

made effective by the present organization?" He added that he was not in accord with the views expressed in the commission's annual reports that it should be relieved from the task of preparing a plan of consolidation, saying that "if consolidations are to be made, they should be in line with a definite and comprehensive plan prepared by someone not financially interested in the result, so that public and not private interest may first be served."

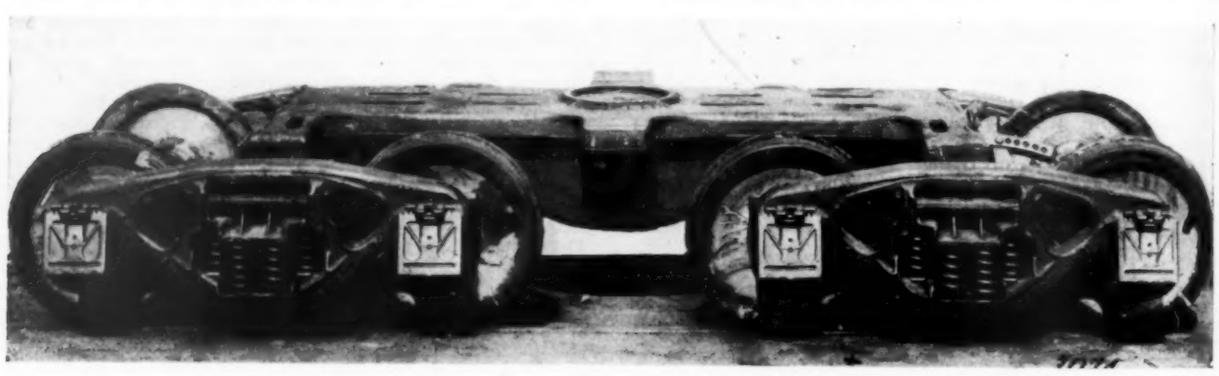
Commissioner Taylor said he thought "this grant, which permits the most important so-called unification of any of the railroads of the United States, before Congress has spoke again upon the subject, is at least premature."

The Milwaukee Acquires 200-Ton Flat Cars

THE Chicago, Milwaukee, St. Paul & Pacific has recently received from the Standard Steel Car Company, two 200-ton flat cars, equipped with eight-wheel trucks developed especially by the Buckeye Steel Castings Company, Columbus, Ohio, to carry satisfactorily the heavy loads contemplated in this design. The cars are intended for the service of the A. O. Smith Corporation, Milwaukee, Wis., in transporting unusually heavy machinery, including large gasoline stills used in a new cracking process. The original plan was to provide six-wheel trucks for these cars, with 9-in. by 14-in. journals, but the disadvantages of the excessively large journals and boxes were apparent and this idea was finally abandoned in favor of using the special eight-wheel trucks illustrated, having A.R.A. standard axles with 6½-in. by 12-in. journals. At 60,000 lb. per axle, the capacity of the eight axles is 480,000 lb., which, with the total wheel and axle weight of 22,000 lb., gives a total maximum rail load of 502,000. The light weight of the car is 103,000 lb., leaving a maximum permissible loading per car of 399,000 lb., or practically 200 tons. The trucks assembled with wheels and axles in place weigh 25,200 lb. apiece.

Each eight-wheel truck consists essentially of two four-wheel trucks (suitable for 90-ton cars), which support a large cast steel bolster spanning the two standard truck bolsters. The side-bearing arrangement is such that each 4-wheel truck can swivel on its bolster center and the span bolster swivels on the main body bolster center. Ample flexibility of the entire eight-wheel truck design in negotiating curves is, therefore, provided. The truck side frames are of the Dalman type, there being seven nests of coil springs with a total capacity of 112,000 lb. per frame.

No unusual difficulties were encountered in the design of the car body which is entirely of steel with the load carried on a built-up underframe consisting of four deep girders suitably riveted and tied together with crossbraces to form a rigid unit. The main body bolsters are pressed steel shapes built into the car body itself. All side bearings, of which there are 12 per car, are of the friction type.



The Two Four-Wheel Trucks Are United by a Buckeye Cast Steel Span Bolster

Milwaukee 200-Ton Flat Car Just Out of the Hammond, Ind., Plant of the Standard Steel Car Company

Atchison, Topeka & Santa Fe

Shows high degree of operating efficiency, maintained by wise capital expenditures over long term of years

IN practically every figure ordinarily used to gage the efficiency of a railroad the Atchison, Topeka & Santa Fe reflects a high degree of attainment. Its operating ratio in the period 1921-27 was never higher than 73.9 (1922) and it dropped as low as 64.3 (1926). The ratio of transportation expenses to operating revenues declined steadily from 35.3 per cent in 1921 to 29.2 in 1927. Pounds of coal, or its equivalent, per 1000 gross ton-miles declined from 151 in 1921 to 115 in 1927. Freight cars per train rose in this period from 40.8 to 50.8. Gross ton-miles per train-hour mounted from 19,518 in 1921 to 27,257 in 1927. Annual mileage per locomotive rose from 26,556 in 1921 to 32,135 in 1927.

Of the 71 railroads having freight revenues of more than $10,000,000 in 1927 there were only nine which had a lower freight expense per freight gross ton-mile than the Atchison, Topeka & Santa Fe. Of the nine, one was a Santa Fe subsidiary and of the remaining eight, four were heavy-tonnage coal roads operating under extremely favorable conditions. In 1927, of the 71 roads only six had a lower average total of road freight wages, fuel, supplies and enginehouse expense per gross ton-mile than the Santa Fe and four of these were heavy-tonnage coal roads. Only three roads in the Western District showed in 1927 greater average gross ton-miles per train hour and only two of these three are in any way comparable with the Santa Fe in the class of traffic handled.

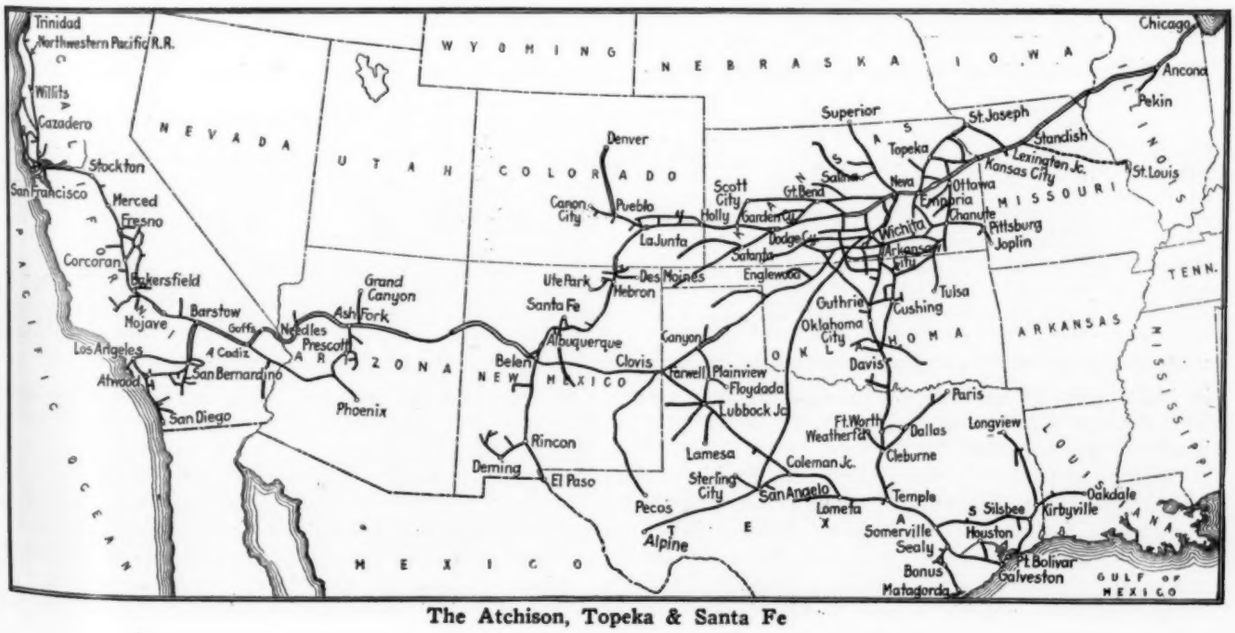
Persistent Betterment Policy

The favorable showing the road makes in practically all of its indices is due in a large degree undoubtedly to its persistent policy of expenditures for additions and betterments calculated to secure operating economies; to its favorable location; and to the extent and modernity of its plant which enable it to maintain a high quality of service with a heavy volume of business.

The building up of the plant dates back to the days of the receivership and reorganization in the 90's. Then began the careful and continuous investment of earnings in the property—a policy which has been continued to the present. The expenditures made each year for additions and betterments and the persistency of a high standard of maintenance has kept the road constantly in a favorable position to secure an adequate share of the natural increase in traffic in its territory. In addition to its additions and betterments of existing lines, the Santa Fe has been alert also in the construction of extensions to its lines to tap newly developed traffic-producing areas. Table III gives some details regarding the extent of such expenditures as compared with corporate income and dividends.

Table I—Two Years Improvement in Freight Service Operating Efficiency

	10 Months 1928	10 Months 1926	Per cent of change Inc.	Dec.
Mileage operated	10,452	10,200	2.5	
Gross ton-miles (thousands)	33,357,962	32,422,203	2.9	
Net ton-miles (thousands)	12,170,868	11,950,336	1.8	
Freight train-miles (thousands)	16,794	17,194		2.3
Freight locomotive-miles (thousands)	19,403	19,607		1.0
Freight car-miles (thousands)	870,333	852,347	2.1	
Freight train-hours	1,127,554	1,254,048		10.1
Car-miles per day	36.9	36.5	1.1	
Net tons per loaded car	21.5	21.8		1.4
Per cent loaded to total car-miles	64.9	64.2	1.1	
Net ton-miles per car day	517	512	1.0	
Freight cars per train	52.8	50.5	4.6	
Gross tons per train	1,986	1,886	5.3	
Net tons per train	725	695	4.3	
Train speed, miles per train hour	14.9	13.7	8.8	
Gross ton-miles per train-hour	29,584	25,854	14.4	
Net ton-miles per train-hour	10,794	9,529	13.2	
Lb. coal per 1,000 gross ton-miles	109	116		6.0
Loco. miles per loco. day	68.5	67.3	1.8	
Per cent freight locos. unserviceable	14.8	15.4		3.9
Per cent freight cars unserviceable	5.7	5.8		1.7



The Atchison, Topeka & Santa Fe

It suffices to call attention to the fact that in the five-year period 1923-27 inclusive, additions and betterments averaged $35,446,456 per year and expenditures for construction and acquisition of new mileage averaged $4,222,848—a total for these two averages of $39,669,304. During the same five-year period the average surplus carried each year to profit and loss after dividend disbursements was $24,700,087. The balance sheet of the system at the end of 1927 showed a corporate surplus almost equal to the entire outstanding capital stock at that date. Dividends have been paid on the common stock since 1901, beginning at 3½ per cent and being increased from time to time until last year when the regular rate was raised to 10 per cent.

The character of the system's capital expenditures has of course been varied. At the end of 1927 its mileage of additional main track was 13.6 per cent of its total route mileage, as compared with 10 per cent in 1920. The ratio of the mileage of yard tracks and sidings to total route mileage rose from 40 per cent in 1920 to more than 44 per cent in 1927. Total route mileage in the same period increased 5 per cent. The route mileage equipped with automatic signals was more than tripled in this period.

Locomotive Tractive Power Increase

The number of locomotives in service at the end of 1927 totaled 2090, an actual decrease when compared with the 1920 total which was 2,195. Average tractive effort in the interim, however, rose from 36,741 lb. in 1920 to 48,075 in 1927, an increase of 31 per cent. The average locomotive weight in the same interval, however, increased only 19 per cent.

During the past four years the Santa Fe has undertaken capital improvements of considerable magnitude, designed to facilitate its operations. Among these, exclusive of additional main tracks and the extension of automatic signaling, are included a number of large bridge projects—notably a new double-track structure over the Mississippi and another over the Arkansas; the relocation or reconstruction of several important sections of line; additional yard facilities at a number of points; new coaling plants; and many new facilities of primary importance to shippers, such as elevators, team tracks, icing stations, etc.

The system ordered a total of 75 locomotives in 1926, as compared with 15 in 1925, 10 in 1927 and four in 1928. In the past four years it has ordered 9,900 freight cars of which 6,850 were placed in 1927. In the same year it ordered 167 passenger train cars, as compared with 23 in 1926, six in 1925 and only one in 1928.

Table II—Atchison, Topeka & Santa Fe Operating Results, Selected Items 1916 to 1927

Year	Average mileage operated	Revenue ton miles (Thousands)	Revenue passenger-miles (Thousands)	Rev. per ton-mile cents	Total operating revenues	Total operating expenses	Net operating revenue	Operating ratio	Net railway operating income	Net after interest and other charges
1916	11,259	11,136,119	1,362,721	0.923	$144,290,238	$88,413,487	$55,876,751	61.3	.....	$38,122,189
1917	11,284	12,905,999	1,553,315	0.906	165,529,519	105,222,878	60,306,641	63.6	.....	38,185,547
1918	11,459	12,697,071	1,676,144	...	187,658,223	135,793,059	51,865,164	72.4	$44,206,339	28,348,433
1919	11,500	11,931,108	1,965,496	1.213	209,500,004	156,026,127	53,473,877	74.5	42,025,618	43,098,658
1920	11,584	12,806,129	2,189,233	1.316	254,249,002	218,077,115	36,171,887	81.8	37,380,591	37,634,752
1921	11,678	10,375,038	1,547,074	1.544	228,925,070	173,217,915	55,707,154	75.7	41,268,307	39,331,662
1922	11,701	11,177,224	1,473,295	1.414	225,124,544	166,904,378	58,220,166	74.2	40,003,402	34,382,371
1923	11,782	12,323,632	1,614,123	1.350	238,683,735	173,076,268	65,607,467	72.6	46,362,272	42,087,801
1924	11,831	13,080,878	1,510,070	1.285	235,410,952	170,314,808	65,096,144	72.3	47,283,279	42,151,807
1925	11,954	13,861,804	1,409,504	1.262	236,942,529	163,541,728	73,400,801	69.1	53,666,692	46,157,934
1926	12,121	16,314,038	1,387,536	1.203	259,040,316	168,759,308	90,281,008	65.2	66,078,881	60,631,495
1927	12,350	16,247,802	1,340,720	1.189	255,617,824	178,240,266	77,377,558	69.7	54,603,104	49,754,117

Standard return for operations during federal control, $42,885,310.

High Maintenance Standards

The Santa Fe is noted for its high maintenance standards. The ratio of maintenance of way expenses to operating revenues (Texas lines not included) was 13.7 per cent in 1923, 15.2 in 1924, 13.8 in 1925, 12.9 in 1926 and 16.2 in 1927. The sharp increase in 1927 is explained by an extra-heavy maintenance program in that year bringing an increase of 44 per cent in tie renewals per mile of line and 24 per cent in rail replacements when compared with the preceding year. It is to be noted that this expenditure in 1927 followed a year of record earnings.

The maintenance of equipment ratio has shown no such sharp fluctuation since 1923, the year following the shop strike, when it rose to 24.3. It was 22.7 in 1924, 19.8 in 1925, 18.3 in 1926 and 19.9 in 1927.

In 1927 the Santa Fe system's tonnage was divided as follows: Products of agriculture, 19.13 per cent; animals and products, 3.71 per cent; products of mines, 38.81 per cent; products of forests, 6.26 per cent; manufactures and miscellaneous, 29.08 per cent; l.c.l., 3.01 per cent. These percentages do not vary in marked degree from those of the year 1923—with the exception of animal and forest products which declined somewhat. In general, therefore, it may be said that the increase which occurred from 1923 to 1927 in the San-

Table III—Atchison, Topeka & Santa Fe Selected Items Indicating Financial Position, 1916 to 1927

Year	Capital stock outstanding at end of year	Funded debt at end of year	Interest funded debt	Net corporate income	Preferred dividends	Common dividends	Earnings per share of common	Common dividends paid, per cent	Surplus carried to profit and loss	Additions and betterments	Construction and acquisition of new mileage
1916	$314,663,230	$310,975,282	$12,364,166	$38,122,189	$6,208,685	$12,482,280	...	6	$6,819,091	$6,566,362	$1,061,963
1917	340,751,200	297,229,760	11,852,977	38,185,547	6,208,685	16,486,402	14.49	6	7,057,000	12,385,588	4,412,584
1918	344,629,200	287,969,989	11,696,192	28,348,433	6,208,685	13,289,595	9.97	6	8,760,583	21,156,434	2,526,252
1919	345,959,200	286,639,989	11,654,259	43,098,658	6,208,685	13,351,695	16.54	6	23,438,819	21,863,659	3,279,003
1920	347,047,200	285,553,458	12,015,621	37,634,752	6,208,685	13,441,110	13.97	6	17,881,460	16,168,086	1,867,875
1921	348,889,200	291,072,628	11,952,002	39,331,662	6,208,685	13,518,420	14.68	6	19,485,014	25,061,922	859,374
1922	349,571,200	289,888,269	11,871,255	34,382,371	6,208,685	13,605,660	12.39	6	14,455,363	21,754,321	3,681,833
1923	351,226,200	287,722,594	11,323,743	42,087,801	6,208,685	13,909,245	15.42	6	21,925,078	45,731,974	4,729,610
1924	356,592,200	275,958,984	11,247,995	42,151,807	6,208,640	14,525,594	15.46	6¼	21,372,359	43,442,718	2,507,841
1925	356,582,300	275,933,158	11,246,918	46,157,934	6,208,640	16,268,665	17.18	7	23,632,593	24,988,041	3,695,134
1926	356,582,300	277,178,172	11,256,182	60,631,495	6,208,640	18,011,736	23.41	7¾	36,335,110	26,937,621	8,173,020
1927	356,582,300	277,125,919	11,295,018	49,754,117	6,208,640	23,240,950	18.74	10	20,235,298	36,131,926	2,008,635

ta Fe's tonnage—an increase which amounted to almost 20 per cent—was spread rather evenly over all classes of commodities.

The Santa Fe's distribution of its tonnage among the various classes of commodities does not differ greatly from that of all the railways of the Central Western Region taken together, with the exception that its percentage of manufactured products is somewhat higher and of forest products somewhat lower. Its percentage of originated to total tonnage is somewhat higher than the average for the region and its average haul per ton of freight (317.5 miles in 1927) is considerably higher.

Increased Maintenance Expenses

The following gives some comparative figures of the Santa Fe's (not including Texas lines) financial results for the first eleven months of 1928 as compared with similar periods in 1927 and 1926:

Eleven Months

	Gross Revenue	M. of W. Exp.	M. of E. Exp.	Op. Ratio	Net Ry. Operating Income
1928	$189,400,013	$32,515,214	$36,655,388	69.5	$42,720,644
1927	190,541,990	31,284,023	37,340,621	68.8	43,353,645
1926	191,539,811	25,368,107	34,890,426	64.2	51,199,405

It will be noted that gross revenues have been quite similar for the 11-month period of all three years and that the variation in net railway operating income can be attributed in large part to increased maintenance expenditures during the past two years—particularly in the category of maintenance of way. It has been noted above that this ratio in 1927 rose to 16.2 as compared with 12.9 in 1926. It is manifest from the eleven months' figures of 1928 that this higher ratio was maintained in that year.

Further Expansion in 1928

The year 1928 saw a great expansion in the Santa Fe's mileage by the acquisition of the Kansas City, Mexico & Orient, in addition to ordinary expenditures for new construction and additions and betterments. With the revenues of this property included in its totals and with physical plant in the best possible condition as the result of recent heavy maintenance expenditures the system is well prepared to handle efficiently the prospective heavier business of the current year.

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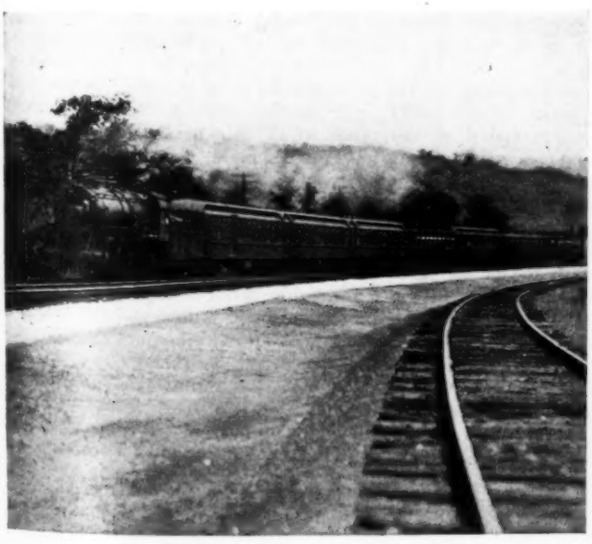

On the Pennsylvania

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended January 19 amounted to 931,880 cars, an increase of 47,197 cars as compared with loading in the corresponding week of last year, and a decrease of 4280 cars as compared with the total in 1927. Coal loading, which amounted to 215,171 cars, was 47,380 cars higher than the total a year ago and 9,333 cars below the 1927 total. Loading in the several districts, the Southern excepted, was larger than in the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, January 19, 1929.

Districts	1929	1928	1927
Eastern	212,597	194,093	211,526
Allegheny	186,255	176,792	186,987
Pocahontas	58,606	50,058	59,452
Southern	142,226	144,962	152,375
Northwestern	111,304	108,609	110,007
Central Western	142,749	135,938	141,422
Southwestern	78,143	74,231	74,391
Total West. Dists.	332,196	318,778	325,820
Total All Roads	931,880	884,683	936,160
Commodities			
Grain and Grain Products	48,149	48,903	44,474
Live Stock	32,240	33,474	30,828
Coal	215,171	167,791	224,504
Coke	12,690	10,544	12,497
Forest Products	59,319	62,692	65,321
Ore	8,383	8,240	9,157
Mdse. L. C. L.	238,986	243,219	242,836
Miscellaneous	316,942	309,820	306,543
January 5	798,723	754,247	933,890
January 12	914,187	907,301	942,731
January 19	931,880	884,683	936,160
Cumulative totals, 3 weeks	2,644,790	2,546,231	2,812,781

The freight car surplus averaged 411,320 cars during the period ended January 8, as compared with 386,132 cars on December 31. The total included 199,443 box cars, 159,147 coal cars, 26,469 stock cars and 12,625 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended January 19 totalled 58,156 cars, an increase over the previous week of 1,069 cars and a decrease from the same week last year of 4,882 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
January 19, 1929	58,156	39,604
January 12, 1929	57,087	36,311
January 5, 1929	46,192	31,007
January 21, 1928	63,038	35,926
Cumulative Totals for Canada		
January 19, 1929	161,435	106,922
January 21, 1928	181,326	102,347
January 22, 1927	174,482	100,996

JOSEPH J. JONES, a taxpayer in the Moffat tunnel district, filed an injunction suit in the district court at Craig, Colo., on January 19, to restrain the Moffat Tunnel Commission from allowing the Denver & Salt Lake to use the Moffat tunnel under the present lease.

THE ST. LOUIS (MO.) BOARD OF ALDERMEN, on January 25 by a vote of 27 to 1, passed a bill fixing the terms under which railroads may use the St. Louis Municipal bridge across the Mississippi river. The rates specified are: $1 for each loaded freight car, 50 cents for empty cars, $1.50 for each passenger coach and $2 for each locomotive. The charge for empty cars will not be made if they are returned across the bridge after having delivered loads on which the $1 was paid. The charges will be revised downward when the net revenue of the bridge justifies such an adjustment of costs.

Communications and Books

Car Truck Action in Curves

BALTIMORE, MD.

TO THE EDITOR:

I note the communication to you in the *Railway Age* of January 12 from F. L. Barber, secretary, Standard Car Truck Company, commenting upon our truck research at Baltimore early in October.

I think Mr. Barber will not object to the following comments on several of his statements.

The car body was made rigid, but no more so than the same standard car when loaded with lumber, which is a rather frequent lading on American railroads.

Any locomotive would safely negotiate the track on which the freight car with the Barber lateral motion trucks derailed.

So far from condemning Barber lateral motion, I highly approve of any lateral motion for freight cars and think every freight car should be so equipped, because lateral shocks on wheel flanges in service are thereby reduced.

I repeat that the Barber lateral motion has no effect in reducing the derailing action of wheel flanges on warped track in curves.

This Baltimore research under practically static conditions simply showed the necessity for cross equalization of the load on freight car trucks. Road tests at all operating speeds will be made shortly and the merit of the Barber lateral motion device and any other lateral motion device will be clearly demonstrated.

T. H. SYMINGTON.

Railroad Men Should Challenge Waterway Propagandist's Misstatements

JERSEY CITY, N. J.

TO THE EDITOR:

A speaker recently made a statement before an audience of railroad and industrial traffic men to the effect that the creation of a deep sea waterway to the Great Lakes will be of great benefit to the American shipping public and to the railroads. One railroad representative ventured to challenge this statement, saying he could see no benefits accruing to the railroads as the result of such a waterway. His challenge was taken more or less as a joke and much laughter ensued. The man sat down probably convinced, as was the writer, that the sentiment of those present was with the speaker.

The speaker began his address, which was mainly devoted to the development of the Port of New York, by expressing his belief that the railroads deserve the unqualified support of the public and should not be restricted to so low a return on their valuation as 5¾ per cent. This was in marked contrast with his attitude in favor of the Great Lakes waterways which will transform into seaports all present lake ports. Attention was directed to the splendidly co-ordinated railway and canal system of Germany where the railways haul the high grade freight and the canals transport the low. This was apparently in justification of his contention that by creating seaports on the Great Lakes the rail carriers will benefit along with the shipping public. With the exception, however, of the slight note of discord occasioned by the unsuccessful attempt of the railroad man to challenge the speaker, complete harmony reigned.

In defense of the railroad man's challenge let me make an observation or two. Suppose Nürnberg in Bavaria should by means of canal construction suddenly become a deep seaport. Nürnberg manufactures millions of toys for export which move by rail to the seacoast for trans-shipment to ocean going steamers. As a deep seaport, however, Nürnberg would no longer ship by rail to the coast, but instead, would load direct to ocean vessels, thereby depriving the railroads of a high class of traffic too valuable to be shipped by canal boat. But Germany has not made seaports of her interior cities. Realizing the economic necessity for efficient railway service and the impotency of such if the rail carriers are hamstrung by serious water competition, the German railroads are allowed their rightful share of the nation's traffic.

It may be inevitable that our Great Lakes' ports will eventually become deep sea ports and I do not question the resulting direct benefits to the shipping public. But there will be certain indirect disadvantages to that same public which may not yet have dawned on their horizon. If ocean-going vessels can load at the lake ports during seven or eight months of the year, it is a certainty that the railroads are not going to participate in the export traffic of automobiles, or any other high class commodity from any of those ports. The loss of this traffic will present to the railroads a problem in depreciated freight earnings of the first magnitude, and unless reimbursement in some other form be forthcoming, the service now rendered the great traffic which will remain unaffected by waterways is bound to deteriorate. This will most certainly not be of benefit to the public, and when the day comes that the rail carriers must find a substitute source of revenue for that lost to them by the construction of a Great Lakes to-the-sea waterway it is not at all unlikely that public sentiment in their favor will be needed. But unchallenged speeches such as I have been alluding to will not tend to cultivate favorable public opinion insofar as concerns the rail carriers.

I would suggest that a railroad man hearing an address which he considers inimical to the best interests of the railroads should immediately take steps to have the Committee on Public Relations provide an intelligent speaker to present if possible before the same audience the same subject from the viewpoint of the railroads. Many unchallenged statements economically unsound and insidious to railroad progress will thus at least become somewhat diluted, and there will result an additional effective method for presenting to the public the great railroad problem of the present day. By so doing favorable popular opinion towards the railroads in the time of crises, such as the construction of a Great Lakes waterway will bring about, can be more certainly depended upon than if unsound ideas are allowed to go unchallenged.

GEORGE ZABRISKIE.

New Book

Propaganda, by Edward L. Bernays. Bound in cloth, 159 pages, 6 in. by 8 in. Published by Horace Liveright, Price $2.50

Five years ago Mr. Bernays' "Crystallizing of Public Opinion" was published and the present book is an extension of the same theme. "Propaganda" is a concise and entertainingly written interpretation of the place which this new type of publicity and advertising and its guiding hand, the "public relations counsel," has in the modern business world. The author gives the clear impression that many years of experience in the swaying of the public mind is behind the facts he sets forth. His description shows the change from the old style of dealing with the public in which effort akin to force was used to the newer method in which the public mind is impressed with personal and general appeals more civilized and more scientific.

As an instance of many well-chosen examples cited, in describing the influence of direct and indirect publicity on the mind of a certain business man, the author says, "He buys a certain railroad stock because it was in the headlines yesterday and hence is the one which comes most prominently to his mind; because he has a pleasant recollection of a good dinner on one of its fast trains; because it has a liberal labor policy, a reputation for honesty; because he has been told that J. P. Morgan owns some of its shares." Mr. Bernays also discusses his subject in connection with the new trends in business, social service, education, art, politics and other determining forces

in present-day life. It is an excellent contribution to the literature on the subject, covering both theory and fact, and is written by one who is not only a successful practitioner in the field but also a keen student of its problems. What the invention of a new method of military attack is to national safety, the development of the science of "propaganda" is to the individual industry; the possession of a new weapon by one makes necessary its acquisition by all who would maintain their *status quo*. Those who guide railroad policy, therefore, will find Mr. Bernays' exposition as applicable to railroad public relations problems, as industrial leaders will find it informative on theirs.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Book and Pamphlets

1928 Transactions of the National Safety Council, Steam Railroad Section. Series of papers on prevention of railroad accidents of all kinds, reprinted from the general transactions. 95 p. Pub. by National Safety Council, Chicago, Ill.

Supplement No. 2 to List No. 1 of Corporate Names of Common Carriers Filing Tariffs, Concurrences, or Powers of Attorney with the Interstate Commerce Commission and Compiled from its Records. Prepared by Section of Tariffs, Bureau of Traffic, Interstate Commerce Commission. Under the headings "Additions", "Eliminations" and "Changes" this pamphlet records recent changes in the railroad world. 17 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., 5 cents.

Tariff Problems of the United States. Railroaders may be interested in "Quarantine Measures as Trade Barriers" by W. G. Campbell, p. 30-35, "Mass Production and the Tariff" by E. A. Filene, p. 43-48, Part III "Agriculture and the Tariffs" p. 120-174, "The Future Tariff Policy of the United States" by Democritus, p. 253-264, and the frontispiece map "European Tariff Walls" although railroads as a subject are hardly mentioned. The volume is the January 1929 issue of the 'Annals'. 290 p. Pub. by American Academy of Political and Social Science, Philadelphia, Penna., $2.00.

Periodical Articles

The Gold Rush in the Air, by Howard Mingos. "These are the boom days in aviation . . . The change from public lethargy to zealous interest has been rather sudden . . ." Those who have curiosity or experience in research in transport history will enjoy the parallels in early railway history which this article will suggest. Illustrated. Saturday Evening Post, January 26, 1929, p 8-9, 92, 97-98.

How Southwestern Agricultural Products Are Creating New Industries, by Columbus Haile. "While the Southwest yet has a long way to go in extension of improved farm methods that will produce the stabilization and diversification which is so obviously important from an economic standpoint, sufficient progress has been made that the new industrial crop is sprouting in many Southwestern communities. Comparatively recent investment in industrial enterprises directly related to this development in M-K-T territory has been approximately three millions of dollars . . ." p. 15. Executive's Magazine, January 1929, p. 15, 36-38.

International Railway Traffic. Organization for Continental Train Working, by F. S. Brant. "The governments having decided to run the Simplon-Orient Express, it was left to the railways to work out the details of operation." What the details were and how they were worked out are presented in this interesting article. Railroaders will be interested in the average speeds including stops in France, Switzerland, Italy, Jugo-Slavia, Bulgaria and Turkey, the prospects for future extension of runs, weights of the train, its very own tariff, international timings, accounts and so on, and the brief differentiation of the functions of the several international railway organizations. Modern Transport, January 12, 1929, p. 3-4.

Looking Backward

Fifty Years Ago

The recent general increase in the loads carried on freight cars has so enlarged the economical size of train (and it seems probable that the requirements of traffic will demand still more powerful locomotives) that the problem will soon present itself of building engines which will take 50 cars instead of 32 over grades of 1 per cent and curves of 10 deg. The maximum axle load now is about 24,000 lb. and an engine, to handle a train of that weight, must have 12 driving wheels. At present it is doubtful whether any locomotive-builder in this country would take an order for such an engine.—*Railroad Gazette,* January 31, 1879.

The United States Supreme Court at Washington, D. C., on January 27, handed down a decision against the United States in the case of the Union Pacific which had brought suit to recover one-half of the compensation due it for the transportation of mails, troops, supplies and munitions of war, amounting to a cash payment of about $800,000. This decision, which established the date of completion of the railroad as November 6, 1869, also settles the question of the payment to the government of 5 per cent of the net earnings from 1869 to 1874, and fixes $2,400,000 as the amount owing to the government.—*Railroad Gazette,* January 31, 1879.

Twenty-Five Years Ago

A decision has been rendered in the first case brought under the Elkins amendment of the Interstate Commerce Act, which was a petition for an injunction to restrain the New York, New Haven & Hartford from carrying coal to tidewater at Newport News, Va., at less than the regular tariff. The temporary injunction was made permanent.—*Railway Age,* February 5, 1904.

The president of the New York, New Haven & Hartford, who has had some success in changing the public attitude of local hostility to one of interest in the railroad's plans, stated in a recent address that the railways must "come out into the open and be seen. They must take the public into their confidence and ask for what they want, and then be prepared to explain satisfactorily what advantage will accrue to the public if they are given their desire. Publicity and not secrecy will win hereafter."—*Railroad Gazette,* February 5, 1904.

Ten Years Ago

Director General Hines will appear before the interstate commerce committee of the Senate on Monday to put before that body a mass of information in support of the five-year extension of federal control of the railroads. More than a half dozen plans for the disposal of the railways were presented to this committee during the past week.—*Railway Review,* February 1, 1919.

The "revolving fund" of the Railroad Administration needs an additional appropriation of $750,000,000, according to an estimate sent by Director General Hines to the secretary of the treasury on January 24 for submission to Congress. Of this amount $381,806,904 is required to settle the accounts of the Railroad Administration for 1918, including the operating deficit estimated at $196,000,000, and the balance of $368,193,096 represents the portion of the capital expenditures for 1919 which will have to be financed temporarily by the government. —*Railway Age,* January 31, 1919.

Odds and Ends of Railroading

Employee-Director

The railways of Germany have recently, for the first time, given a seat on the board of directors to a man from the ranks. He is Mathew Herrmann, a locomotive driver.

Peaches

Figures presented by the Bureau of Railway Economics show America's increasing demand for peaches. We really didn't need corroboration from the bureau, what with those already presented in movies of bathing-beauty contests.—Chicago Daily News.

A Billion Tickets

It would seem that H. N. Hunt, in charge of the ticket stock room of the Long Island, holds the world's record for ticket handling. Mr. Hunt entered the service of the Long Island in 1880, and was placed in charge in 1888. In this 48 years' service in the stock room, Mr. Hunt has handled over a billion tickets without a single error.

A Railway Songstress

Miss Grace Divine, who makes her debut this season at the Metropolitan Opera House, is another railway girl who has graduated to the ranks of opera stars. The new coloratura soprano is the daughter of W. L. Divine, foreign freight agent for the Chesapeake & Ohio.

A Radio Record

This department is skeptical of radio and fish stories, but this one is so well authenticated that it will have to go in. A special short wave receiver was installed in the observation car of the Continental Limited, of the Canadian National. While the train was passing Favel, Ont., 1,219 miles west of Montreal, station 5SW, Chelmsford, England, came in and the operator held it for 15 minutes. At the start of the trip, while the train was standing in the station at Vancouver, B. C., the same set brought in 2XAD, Schenectady, N. Y.

The Waugh Brothers

More than two centuries of service with the Canadian National and its predecessors is accredited to the five Waugh brothers. W. E. Waugh, 38 years' service, died in 1908, while general agent, freight department, Grand Trunk at Milwaukee; R. E. Waugh, 47 years' service, retired as agent in 1926; George T. Waugh, formerly an agent, is also on the retired list, after 36 years' service; Walter Waugh, 42 years' service, is agent at Parkhill, Ont., while James Waugh, 37 years' service, the last of the five brothers to take up railroading, is now general agent, freight department, at San Francisco, Cal.

Trackman Becomes Track Star

"Charley" Ginter, former Pennsylvania trackman and crossing watchman and several times Pennsylvania system champion in 440 and 880-yard track events, has recently been elected captain of the Holy Cross freshman track team. Ginter, who was formerly employed on the Pennsylvania's Sunbury division, entered the Worcester, Mass., institution last fall, and quickly won renown in victories over the track athletes of Harvard, Massachusetts Institute of Technology and Brown.

"From the Bottom of the Sea"

While dredging the bottoms of Bayou Sara, a few miles north of Mobile, Ala., a bridge crew of the Louisville & Nashville brought up a brass locomotive bell, of the type in use four decades ago. Further exploration with the dredge bucket brought to light a framework of white oak on which a tender had once rested, a four-wheel truck, a smokebox door and a brass flag case containing a red flag. Old-timers in the vicinity immediately began to speculate as to how or when the parts began their confinement, the official records being silent on this point. At the time of going to press, the discussion was still raging, without an agreement having been reached.

Old Days in Indian Territory

The short paragraph in your issue of December 15 on the page headed Odds and Ends of Railroading and entitled "Look Out for the Red Skins" recalls an experience of my own at the same time and near the same place. I was then in charge of a Locating Party on the Choctaw, living in camp, and personally scouting around the country in which these same Indians, under Crazy Snake, were on the war path. None of us knew about the uprising, however, until I received mail from Boston with newspaper accounts of it, and by that time they had been pretty well rounded up by the U. S. Cavalry. Your little article served to recall vividly that spring in the "Beautiful Indian Territory" and perhaps a little longing for those palmy days on the turf.

F. LAVIS, *President*,
International Railways of Central America.

Oldest Chair?

The chief clerk in the chief engineer's office of the Central region of the Pennsylvania calls attention to a chair with a service age greater than the Union Pacific desk and the Delaware & Hudson chair recently reported in these columns. The chair, which is still in use in the chief engineers office, entered the service in 1861, in the office of J. B. Jervis, when he was general superintendent of the Pittsburgh, Fort Wayne & Chicago. When Mr. Jervis was appointed chief engineer in 1864, he took the chair with him, and his successor as chief engineer, Felecian Slataper, inherited it in 1866. Thomas Rodd succeeded Mr. Slataper in 1889 and used the chair until his retirement in 1919. Benjamin McKeen, vice-president and corporate engineer, then took over the chair, and on March 1, 1920, it was given to Robert Trimble, assistant chief engineer, and later chief engineer. He kept it until his retirement on December 31, 1926, when it was turned over to his successor, W. D. Wiggins, who still has it. Thus the historic chair has a continuous service record of 67 years in one office and holds the title as the oldest piece of railway furniture.

Station Names

Anderson Weaver, vice-president of Granberry Institute, located in Juiz De Fora, Minas, Brazil, was so intrigued by the names he found in a Southern time-table that he composed the following and sent it to Passenger Traffic Manager W. H. Tayloe:

"After crossing a Sunny Brook of Clearwater, we traveled up Valley Creek toward the Summit or Ridgecrest of Highcliff. There we discovered on the other side of Strawberry Plains the most pleasant garden in Skyland.

"The Greenlawn and the Meadow, the Laurel and Maplewood were very beautiful. Just beyond Faunsdale we came to the White House, where for a season, we enjoyed Tennyson, Whittier and Boswell. Then we visited Arden, Arcadia, Midlothian, Sweet Auburn, Concord and Westminster.

"Thence, with Levi, Lot and Zebulon as our guides, we made the following itinerary: Eden, Adam's Grove, Corinth, Ararath, Joppa, Pisgah, Sharon, Siloam, and Nebo; and on Zion's Hill we had a glimpse of the Pinnacle of the Temple.

"Between Christmas and Valentine, accompanied by a Barber, a Lawyer and a King, we made a tour of certain cities; Berlin, Delhi, Manila, Moscow, Paris, Rio, Rome, Vienna and Versailles. Afterwards we continued our journey to Denmark, Scotland, Persia, Siam and Cuba.

"The Alpha or Climax of our trip was a circuit of Bonaire, Bellevue, Corona, Villa Rica, Alta Vista, Bonia, Bueno, Campo Bello, Casa, Nova, Eldorado and the Golden Gate."

NEWS *of the* WEEK

Great Northern Terminal at Spokane, Wash.

ON THE SEVENTH OF JANUARY, one of the Canadian National oil-electric rail cars finished 14 months' operation without a single day out of service. The distance traveled by the car during this period was about 170,000 miles.

THE GENERAL COMMITTEE of the Purchases and Stores Division, A. R. A., at a meeting held in San Francisco last week, decided to hold the annual meeting of the Division at the St. Francis Hotel, San Francisco, on June 19, 20 and 21.

PAT M. NEFF, of the United States Board of Meditation, appeared before the Senate committee on interstate commerce at Washington on January 28 to reply to objections made to his confirmation for reappointment which were made by representatives of labor organizations at a previous hearing.

THE CENTRAL RAILWAY CLUB will hold its next meeting on February 14 at the Hotel Statler, Buffalo, N. Y. The speaker will be W. H. Sanford, of the American Car & Foundry Company, illustrating his talk with moving pictures. There will be music by the University quartette, of Buffalo.

A SCHOOL with a three-year course for brakemen, firemen and shopmen has been established by the Colorado board of vocational education at Grand Junction, Colo. The school is housed in a specially built car on the Denver & Rio Grande Western and has an enrollment of 250.

EMPLOYEES OF THE ACCOUNTING DEPARTMENT in the Eastern Region of the Pennsylvania are being concentrated in the company's new office building at West Philadelphia, involving the transfer of considerable numbers of men from Wilmington, Del., and Harrisburg and Williamsport, Pa. At Wilmington, about 100 employees, mostly men, have been notified that they will be transferred on February 1.

THE ATTORNEY GENERAL OF NEBRASKA has given an opinion to the Nebraska State Railroad Commission in which he holds that a railroad does not violate the state law by operating a work train with a crew of only one brakeman. He declared that, as the courts have held the law, which specifies the minimum number of brakeman to be employed on a train, not broad enough to include mixed trains neither can it include work trains.

THE UNITED STATES CIRCUIT Court of Appeals has taken under advisement the appeal of the Southern Pacific from the decision of the South Texas Federal District Court by which the railroad was permanently enjoined from interference with the activities of the Brotherhood of Railway and Steamship Clerks. Arguments were heard before the court at New Orleans, La., on January 21. The decree granting a permanent injunction was entered at Houston, Tex., on April 19, 1928.

SENATOR WHEELER, of Montana, on January 24 submitted an amendment to the independent offices appropriation bill proposing to increase the appropriation for the general work of the Interstate Commerce Commission from $2,834,464 to $2,887,000, thereby restoring the reduction made by the House committee in the amount asked by the commission to enable it to employ additional examiners; and also to increase the amount which may be expended for personal services in the District of Columbia from $2,209,464, to $2,250,000.

"RAILROAD NIGHT" will be featured at the semi-annual banquet of the American Retailers' Association at the Hotel Statler, St. Louis, Mo., on February 7. The association will be in convention from February 4 to 11, inclusive. The presidents and vice-presidents of the railroads with general offices in St. Louis will each make ten minute talks at the meeting. They are: L. W. Baldwin, president of the Missouri Pacific; Columbus Haile, president of the Missouri-Kansas-Texas; James M. Kurn, president of the St. Louis-San Francisco; James E. Taussig, president of the Wabash; Daniel Upthegrove, president of the St. Louis Southwestern; Benjamin McKeen, vice-president of the Pennsylvania; Frank H. Hamilton, vice-president, secretary and treasurer of the Frisco and Ernest E. Norris, vice-president of the Mobile & Ohio. Other speakers will include James E. Hannegan, chairman of the Southwestern Passenger Association, and P. W. Coyle, traffic commissioner for the St. Louis Chamber of Commerce.

Correction

In the *Railway Age* of January 19, page 209, in an article on the operations of the Baltimore & Ohio, it was incorrectly stated that the maintenance of equipment ratio to operating revenues was 36.5 per cent in 1923 and 33.4 per cent in 1927. These figures actually are the total maintenance ratios—maintenance of way and equipment combined. The maintenance of equipment ratios for the two years mentioned were 25 per cent and 20.9 per cent respectively.

Pennsylvania Shopmen's Pay Advanced

The Pennsylvania, following a conference between officers of the road and representatives of employees, have advanced the pay of shopmen to the extent of making an increase of $3,500,000 annually in the pay rolls. The increase inures to the benefit of about 36,000 employees scattered throughout the system, and it becomes effective on February 1. The basic rate for the principal groups is advanced from 78 cents an hour to 82 cents. Carmen receive an increase of four cents, from 70 cents to 74 cents, and the car cleaners, who received an increase recently of two cents an hour, are granted an additional advance of one cent.

Conference on Motor Coach Legislation

Hope that the bill to regulate interstate commerce by passenger motor vehicles may be acted upon by the House in time for passage by Congress at this session was expressed by Chairman Parker of the House committee on interstate and foreign commerce after a conference on January 23 and 26 with representatives of various interests concerned with the proposed legislation. At the conference

there was a free exchange of views regarding details of the Parker bill, H.R. 15,621, and of a letter from the Interstate Commerce Commission suggesting some changes with a view to clarification of its provisions, after which the committee expected to give further consideration to the bill in executive session.

Bill to Encourage C. P. R. Use of B. & M. Line

A bill designed to encourage the Canadian Pacific and the Boston & Maine to agree to joint use of the line of the latter company from Wells River, Vt., to Portsmouth, N. H., by the former company has been introduced in the legislature of New Hampshire.

According to press dispatches, the possibility that the Canadian Pacific might be interested in operating its own trains into the port of Portsmouth, and of the Boston & Maine's acquiescing in such a proposal has aroused considerable interest in New Hampshire and has prompted the circulation of petitions intended to influence the legislature for favorable action on the bill.

The bill, briefly, provides that any railroad corporation or public utility may jointly use the facilities of another company when such use is found, by the Public Service Commission, to be in the public interest.

Peace River Railway Construction

Completion of the Northeastern Railway from Stewart to the eastern boundary of the Peace River block, within five years, and the extension of a branch line up the Findlay river from Fort Graham to tap the mineralized region of the Ingenika district, is promised for this session of the British Columbia Legislature by George A. Walker, Vancouver member. In order to carry through the line it becomes necessary to amend the act of 1911 under which a start was made by the old McKenzie and Mann interests and fourteen miles of railway grade was laid down from Stewart.

Authority is sought to increase the capitalization of the company from $2,000,000 to $10,000,000, and to permit the enlargement of the amount of bonds per mile of construction that may be issued from $35,000 to $50,000. This becomes necessary owing to the increased cost of construction since 1911 when the original act was passed.

W. & L. E. Authorized to Discontinue Station

The Interstate Commerce Commission on January 25 issued Service Order 48, authorizing the Wheeling & Lake Erie to temporarily discontinue the operation of its passenger trains into and out of its Ontario street passenger station at Cleveland, Ohio, and to use the tracks and station facilities of the Erie and the Cleveland, Cincinnati, Chicago & St. Louis, pending the decision of the commission on the road's applications for authority to abandon the station and to accept passenger station facilities and service in the new union station of the Cleveland Terminals Company. Hearings on the application were held before Examiner Sullivan beginning on January 21. The application was opposed by the Pittsburgh & West Virginia, a stockholder in the Wheeling & Lake Erie, which objected among other things to the proposal to sell its property to the Cleveland Terminals Building Company. The application for a service order stated that the Ontario street station is now in an unsafe condition.

Harvard Summer Railway Course to Be Continued

The courses in railway transportation, given by Professor William J. Cunningham of Harvard and Professor Winthrop M. Daniels of Yale, will again be included in a special summer session for business executives to be offered at the Harvard Graduate School of Business Administration, Cambridge, Mass., from July 1 to August 10. These courses were given experimentally last summer and, according to the announcement, are to be continued in response to a demand from business men.

In addition to the transportation course the summer sessions will offer instruction in six other business subjects. These are: The interpretation of financial statements, public utility management and economics, bank management, sales management, retail distribution and trust management. Classes will be limited to 50 men and will be held four hours a day for the six week period.

As in the 1928 sessions instruction procedure will be based on the case system which is the method employed at the regular winter sessions of the school. It involves classroom discussion of principles underlying actual experiences, policies and decisions of business firms and executives who have released such information and permitted its preparation as case material for the various courses.

Plans for P. R. R. $50,000,000 Jersey City Terminal

Plans for the Pennsylvania's new $50,000,000 ship and rail terminal at Jersey City, N. J., were outlined recently by R. C. Morse, general superintendent of the New York Zone of the company's lines, before a meeting of the Jersey Marine Association.

As outlined by Mr. Morse, the railroad contemplates replacement of old structures along the waterfront, the extending of ferry slips at the foot of Exchange place, Jersey City, to the northern end of the yard. The first unit of the new terminal, which will cost approximately $20,000,000 and which it is expected will be completed in about a year will involve the elimination of the present passenger and storage yards and three float bridges, two of which will be replaced, and the elimination of pier D and three open piers, the construction of a 10-story warehouse, which eventually will cover a space six-blocks square, three double-decked piers, 900 ft. long, 125 ft. wide with slips 330 ft. wide to provide berths for ocean-going vessels.

In co-operation with the project as planned by the Pennsylvania, three ordinances providing for the construction of the first unit of the new terminal were passed after the first reading at a recent meeting of the Jersey City Commission. Two more readings are required before the ordinances become effective, but no obstacles are expected in carrying out the project. One ordinance provides for "dead-ending" streets on the ground near the Pennsylvania's present Exchange place terminal; another authorizes the exchange of the city's Bergen street pier for the Pensylvanias Pier B at the foot of Grand street; the third provides for the city's own development of a marine terminal adjacent to the railroad's project.

C. P. R. 1928 Earnings

Net profits of the Canadian Pacific Railway for 1928 were at the highest level in the history of the road. The statement reveals operating net for the year at $51,694,451, as against $39,515,571 in 1927, an increase of $12,178,880.

Gross earnings during 1928 show an increase of $27,893,545 over 1927, according to this report, while operating expenses increased by $15,714,664.

For the month of December, net operating income amounted to $3,156,773, as compared with $1,673,166 in December of 1927, an increase of $1,483,656. Gross earnings showed an increase of $2,324,846 over December of the preceding year, while operating expenses increased by $841,239.

The statement of earnings and expenses for the month of December, 1928, and for the twelve months ending with December, with comparisons, follow:

	DECEMBER. 1928	1927	Inc.
	$	$	$
Gross	21,092,097	18,767,251	2,324,846
Exp.	17,935,323	17,094,084	841,239
Net	3,156,733	1,673,166	1,483,606
	TWELVE MONTHS 1928	1927	Inc.
	$	$	$
Gross	229,039,296	201,145,751	27,893,545
Exp.	177,344,845	161,630,180	15,714,664
Net	51,694,451	39,515,571	12,178,880

Back-Up Train Collides with Suburban Train on C. & N. W.

One passenger was killed and 35 others were injured in a collision on the Chicago & North Western at Chicago, shortly after 1:20 on the afternoon of January 26. Train 559, consisting of seven cars, loaded with homebound suburban passengers, was struck by a six-car train of empty cars, which was being backed into the station, preparatory to leaving for Milwaukee at 2 o'clock. The accident occurred three blocks north of the station, while train 559 was moving northward through a crossover from track 2 to track 1, the westerly track. The empty train was backing southward on track 2, and the steel observation car on the rear end first struck the fifth coach back of the engine on train 559 and then tore the side out of the following coach, a wooden car. It was in this coach that the casualties occurred.

The empty train was in charge of a foreman of 31 years' experience. In his

testimony at the coroner's inquest, this foreman stated that he had tested the air on the empty train after leaving the coach yard and found it to be working properly. He also testified that as he approached a signal bridge about 200 ft. north of the crossover, he saw a signal set against his train, and endeavored to stop the train by attempting to apply the air, although he did not signal the engineman by means of the train line. He testified that the air refused to work properly and that the train continued at an estimated speed of about eight miles an hour until it struck the other train.

Further testimony by the foreman who took charge of the empty train after the accident indicated that because of ice in the air hose the air was not working properly. He testified that he found the air and steam hose disconnected and that when he hooked them up he could get no pressure but that after several attempts to open the hose a lump of ice finally came out, after which the air hose functioned satisfactorily. The coroners jury concluded that the accident was caused by failure of the brakes to work because of ice in the air line.

Progress of B. & M.-M. I. T. Railway Course

The progress of the co-operative course in railroad transportation, conducted by the Massachusetts Institute of Technology and the Boston & Maine, during the first year of its existence was described in an article published in the Tech Engineering News of December, 1928.

This course, which was announced in the *Railway Age* of January 28, 1928, and described in detail in the *Railway Age* of March 3, 1928, was designed to dovetail scientific instruction at the school with practical experience on the railway. It extends over five years and leads to a Master's degree. After the first two years, which are spent at the Institute, the students alternate between the school and the Boston & Maine.

Students are registered in the first three years of the course and thus the third year group is now with the B. & M. Mechanical department. The work of each student is so scheduled as to permit his participation in all important operations of that department. This is evident from the schedule of one student taken as an example. It calls for: Locomotive shop, four weeks; signal department, two weeks; engine house, three weeks; car shop, two weeks; office of the mechanical engineer, three weeks; locomotive operation, three weeks; office of the mechanical superintendent, one week. Upon leaving the Mechanical department a similar schedule will be arranged for the students in the Maintenance of Way and Operating departments and in the general offices.

I. C. C. Discontinues Conference Rulings

The Interstate Commerce Commission announces that its conference rulings, which have been issued from time to time since 1908, have been rescinded in their entirety and their use as authority is discontinued. This action has been taken, according to the commission's notice on the subject, without reference to the correctness of individual rulings, but for the reason that although the rulings have served a useful purpose in the past, it is not now practicable or desirable to revise and amplify them, or to continue their publication. The last issue was dated August 1, 1917.

"The commission has considered the revision and possible enlargement of its conference rulings," upon questions raised or submitted in conference, it says, but "Many of the rulings have been made obsolete, as the subject matter has since been dealt with in formal reports and orders of the commission or in various formal circulars. Others are incorrect, and should be modified or rescinded, because counter to subsequent acts of Congress. The conference rulings cover only a portion of the activities of the commission. To correct and bring the outstanding rulings to date, without the formulation and inclusion of many like informal correspondence rulings upon other phases of the commission's jurisdiction, would give undue emphasis to parts of its activities."

Hearing on Western Pacific Extensions

The hearing before Examiner H. C. Davis of the Interstate Commerce Commission on the application of the Western Pacific for authority to construct about 170 miles of lines in California, which opened at Fresno, Cal., on January 10 and was moved to San Francisco, on January 17, was brought to a close in the latter city on January 23. Mr. Davis ordered both the Western Pacific and the Southern Pacific, which is opposing the construction, to submit briefs before May 1.

Permission is asked to construct an extension from Nilegarden, Cal., to King's River, via Fresno, 138 miles, at a cost of about $8,500,000. L. W. Baldwin, president of the Missouri Pacific; J. S. Pyeatt, president of the Denver & Rio Grande Western, and C. E. Spens, executive vice-president of the Chicago, Burlington & Quincy, testified that the construction of the new line in central California would materially increase the freight traffic over their railroads. They said that their lines cannot hope at present to get any additional business from this section because of the dominance of the Southern Pacific. Mr. Pyeatt declared that unless the Rio Grande Western attracts additional business it cannot expect to remain solvent. All three believed that the extension would stimulate competition, providing quicker service to certain parts of the country for fruit shipments. The Southern Pacific and the Santa Fe presented witnesses who testified that the territory involved is now adequately served by their companies.

The supervisors of Fresno county indicated that in case the line is authorized, the tracks must go above or below all paved highways crossed within the county.

H. M. Adams, president of the Western Pacific presented the application for a line from Twenty-fifth street in San Francisco to Redwood City, 25 miles, at a cost of about $3,700,000. This application was opposed by the Southern Pacific and the South San Francisco Belt Railroad, which is operated by the Southern Pacific.

Mr. Adams pictured the proposed extension on the west side of San Francisco Bay as a link in a new transcontinental route which through competition would bring about improved transportation service to California. To form a connection with its line on the east side of the Bay, Mr. Adams said that later an application would be made for trackage rights over the Southern Pacific Dumbarton bridge between Redwood City and Niles; and if this were refused the Western Pacific would be prepared to ask for authority to construct its own bridge across the Bay.

H. K. Faye, freight traffic manager of the Western Pacific, estimated that by the end of the first year of operation of the new line it would originate 926 carloads of freight and that the traffic would rapidly increase. J. W. Williams, chief engineer of the railroad, estimated that 18 months would be required to construct the line.

F. S. McGinnis, passenger traffic manager of the Southern Pacific, said that there was no public need or necessity for a competing railroad on the Peninsula. H. C. Hallmark, assistant freight traffic manager of the S. P., testified that such a line would entail an annual loss to his railroad of more than $200,000. Each side presented a large group of witnesses.

Meetings and Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, 165 Broadway, New York City. Next meeting, April 30-May 3, 1929 Stevens Hotel, Chicago. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred Venton, Crane Company, 836 So. Michigan Blvd., Chicago. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—J. D. Gowin, 112 W. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next meeting, June 25, 1929, Denver, Col.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next annual convention, June 4-7, 1929, Mexico City.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—L. M. Jones, Supt. of Sleeping and Dining Cars, C. M. St. P. & P., Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 292 Madison Ave., New York. Annual convention, September 28-October 4, 1929, Cleveland, Ohio.

AMERICAN RAILROAD MASTER TINNERS' COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y. Division I.—Operating—J. C. Caviston, 30 Vesey St., New York, N. Y. Freight Station, Section—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.
Protective Section—J. C. Caviston, 30 Vesey St., New York. Annual meeting, April 16-18, 1929, Atlanta-Biltmore Hotel, Atlanta, Ga.
Safety Section.—J. C. Caviston, 30 Vesey St., New York. Annual meeting April 23-25, 1929, Claypool Hotel, Indianapolis, Ind.
Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Next convention, Sept. 10-12, 1929, St. Paul, Minn.
Division II.—Transportation.—G. W. Covert, 431 South Dearborn St., Chicago. Next meeting, April, 1929.
Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.
Division IV.—Engineering.—E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Annual convention, March 5-7, 1929, Palmer House, Chicago. Exhibit by National Railway Appliances Association.
Construction and Maintenance Section.—E. H. Fritch.
Electrical Section.—E. H. Fritch.
Signal Section.—H. S. Balliet, 30 Vesey St., New York. Next meeting, March 4-5, 1929, Hotel Stevens, Chicago.
Division V.—Mechanical.—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual meeting, June 25-28, 1929, Los Angeles, Cal.
Equipment Painting Section.—V. R. Hawthorne, 431 South Dearborn St., Chicago. Annual meeting, 1929, Kansas City.
Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y. Annual meeting, June, 1929, San Francisco.
Division VII.—Freight Claims. — Lewis Pilcher, 431 South Dearborn St., Chicago, Ill. Annual meeting, May 21-24, 1929, Hotel Willard, Washington, D. C.
Division VIII.—Motor Transport.—George M. Campbell, American Railway Association, 30 Vesey St., New York, N. Y.
Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILROAD BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. Ry., 319 N. Waller Ave., Chicago. Annual convention, 1929, New Orleans, La. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION. E. L. Taylor, asst. to v.p., N. Y., N. H. & H., New Haven, Conn. Annual meeting, May 22-24, 1929, Houston, Tex.

AMERICAN RAILWAY ENGINEERING ASSOCIATION. —(Works in co-operation with the American Railway Association, Division IV). E. H. Fritch, 431 South Dearborn St., Chicago. Annual convention, March 5-7, 1929, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—Miss Page Nelson Price, Norfolk & Western Magazine. Roanoke, Va.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M., St. P. & P. R. R. 11402 Calumet Ave., Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—Secretary: E. H. Lunde, Federal Machinery Sales Co., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, 30 Church St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 228 N. LaSalle St., Chicago.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Next meeting, June 19-21, 1929, Detroit, Mich.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS. —Jos. A. Andreucetti, C. & N. W., Room 413 C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th & H Sts., N. W. Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—E. H. Weaver, Westinghouse Air Brake Co., 80 E. Jackson Blvd., Chicago. Meets with International Railway General Foremen's Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Annual exhibit at convention of American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charron St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO. —A. J. Walsh, 5874 Plymouth, Apt. 18, St. Louis, Mo. Meetings, first Tuesday of each month, except July and August. Broadview Hotel. East St. Louis, Ill.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—(See Master Car Builders' and Supervisors' Association.)

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 811 Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, except July, August, September, Hotel Hollenden, Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R. Detroit, Mich. Next meeting, August 20-22, 1929, Fort Shelby Hotel, Detroit, Mich. Exhibit by International Railroad Master Blacksmith's Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—W. W. Criley. Ajax Mfg. Co., Cleveland, O.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—L. G. Plant, 80 E. Jackson Blvd., Chicago. Next meeting, May 7-10, 1929, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—S. A. Witt, Detroit Lubricator Co., 820 S. Michigan Blvd., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKER'S ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Annual meeting, May 21-24, 1929, Hotel Biltmore, Atlanta, Ga.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual convention, April 23-25, 1929, Arlington Hotel, Hot Springs, Ark.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Next convention, Aug. 27, 1929, Glacier National Park.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: A. W. Smallen, C. M. St. P. & P., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—Harry D. Vought. 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July, and August.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings 2nd Tuesday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Annual meeting, April 30-May 3, Hotel Cleveland, Cleveland, O.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1406 Packard Bldg., Philadelphia, Pa. Annual meeting, November, 1929, Hotel Stevens, Chicago.

RAILWAY CAR DEPARTMENT OFFICERS' ASSOCIATION. (See Master Car Builders' and Supervisors' Association.)

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION —J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division and Purchases and Stores Division, American Railway Association. June, 1930. (No exhibit at 1929 meeting.)

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.

RAILWAY TREASURY OFFICERS ASSOCIATION—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Exhibit by Track Supply Association. Next convention, Stevens Hotel, Sept. 19-21, 1929, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—Clyde Kimball, Inman Shops, Atlanta, Ga. Meets semi-annually.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, June, September and November. Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & A. Ry., Atlanta, Ga.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., 80 E. Jackson Blvd., Chicago. Meets with Roadmasters and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, Gen. Supt., R. S., New York Central, Buffalo, N. Y. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 189 West Madison St., Chicago. Regular meetings, 3rd Monday each month, except June, July and August.

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Rock Island Officers Inspecting Their New Commissary at Chicago

Foreign

Tank Cars for Milk Traffic In England

The London & North Eastern of Great Britain, in co-operation with the United Dairies, Ltd., recently commenced operating tank cars for the transportation of milk into London. The tanks are glass lined and have a capacity of 9,000 gallons. Seven of these cars have been placed in service.

Disastrous Collision in Roumania

Press dispatches of January 16 report a collision near Turnuseverina Roumania, on that day, in which 14 persons were killed and 40 or more injured. In the dead of night, an express train from Paris to Bucharest collided with a similar train headed in the opposite direction, which had been stopped because of some defect in a car. The wreck took fire from a gas tank and most of the 14 persons were burned to death. The reports say that the engineman as well as other members of the crew were found to have been under the influence of liquor.

A 30 Track Terminal for Paris

Construction work is under way on the enlargement of facilities of the Paris terminal of the Eastern Railway of France which includes a new station building and provision for 30 platform tracks. This project, which is to be completed in 1931, is the sixth enlargement since the terminal was opened in 1855 with two platform tracks and a four-track approach. Since that time more trackage has been added periodically until 1918 when the total tracks had reached the present number of 18, now being used to capacity. The annual number of outbound passengers through this terminal has increased from 2,000,000 in 1878 to more than 25,500,000 during the past few years.

New South Wales Government Railways

Gross revenues equivalent to $92,673,700, operating expenses of $71,863,300 and net from operations of $20,810,400 were reported by the New South Wales Government Railways of Australia for the year ending June 30, 1928, according to the annual report of the commissioners. Interest charges equivalent to $28,642,500, however, converted the $20,810,400 net from operations into a deficit equivalent to $7,837,100.

The foregoing figures compare respectively with a 1926-1927 revenue of $92,074,800, operating expenses of $67,185,800 and net from operations equivalent to $24,889,000. Freight revenue in 1927-1928 declined to $49,933,100 from a 1926-27 figure of $51,232,000 but passenger revenue increased from $40,842,800 in 1926-27 to $42,740,600 in 1927-28 and thus more than offset the freight decline to bring increased gross revenues of about $600,000. The increase in operating expenses of about $4,000,000, however, brought the lower net.

Maintenance of way expenses which increased $2,000,000 from the previous year accounted for more than half of the augmented costs. Another $1,600,000 of the increase is assignable to what is designated as the cost of maintaining locomotive power. This charge is distinct from the cost of maintaining the rolling stock since it includes the outlay for engine house labor and supplies, wages of locomotive engineers and firemen, coal, electric current, water and other supplies—items regarded as transportation expenses in the United States.

At the end of the year there were in operation 5,867 miles of line as against a mileage of 5,750 at the close of 1926-1927. The capital investment increased from $549,283,000 to $574,583,900 and indicates a capital cost of approximately $100,000 a mile.

Freight traffic during the year amounted to 15,433,000 long tons compared with 17,224,894 long tons during the previous year. The number of passengers carried increased from 141,615,806 in 1926-1927 to 148,046,881 in 1927-1928. Total train miles rose from 26,325,847 to 26,896,580 while revenues per train mile fell from $3.45 to $3.40 and expenses increased from $2.52 to $2.63.

L. N. E. 1929 Locomotive Construction Program

Directors of the London & North Eastern of Great Britain have authorized the construction of 110 new locomotives during 1929, according to a recent announcement in the Times (London) Eight of these new locomotives will be of the "Flying Scotsman" Pacific type for express passenger service on the east coast route to Scotland.

Other locomotives to be constructed include 12 of the 4-6-0 type also for express passenger service, nine of the 2-6-0 type for both freight and passenger service, 27 of the 0-6-0 type for freight service, 28 tank locomotives, six suburban tank locomotives and 20 switchers. All except the switchers will be constructed in the shops of the London & North Eastern.

Commonwealth Railways of Australia

Gross revenues equivalent to $2,921,300, operating expenses of $2,617,400 and a net from operations equivalent to $303,900 were reported by the Commonwealth Railways of Australia for the year ending June 30, 1928. The net from operations, however, was converted into a deficit equivalent to $1,034,700 after the deduction of interest charges amounting to $1,338,600.

The foregoing figures compare with 1926-1927 gross revenues of $2,413,700, operating expenses of $2,296 200, a net from operations of $132,500, interest charges of $1,552,000 and a deficit after fixed charges of $1,419,600. For the year 1925-1926 there was a $530,484 deficit after operations. This was increased by interest charges to produce a $2,032,500 deficit for that year. The year 1926-1927 was the first since 1920-1921 in which operations produced a surplus to apply against the interest charges. An operating ratio of 150.10 in 1920-1921 fell consistently, with a slight upturn in 1925-1926, until it reached 94.33 in 1926-1927 and 89.59 in 1927-1928.

A capital investment equivalent to $60,577,400 was reported as of June 30, 1928. This compares with an investment of $59,914,600 at the close of the previous year. The percentage of net from operations to total capital was 0.5 during the past year as against a 1926-1927 percentage of 0.22.

The Commonwealth Railways are comprised of four units: The Trans-Australian, the Central Australia, the North Australia and the Federal Territory Railway. The Trans-Australian with 1,051 miles of 4 ft. 8½ in. gage line is the largest and accounted for $222,400 of the $303,900 net from operations. The Central Australia with 477 miles of 3 ft. 6 in. gage returned $37,000 in net while the North Australia, another line of 3 ft. 6 in. gage, operating 192 miles, earned $5,200. A deficit of $10,700 resulted from the operation of the five-mile Federal Territory line which is of the 4 ft. 8½ in. gage. The year 1927-1928 was the first in which three of the four units reported a net from operations. In 1926-1927 only the Trans-Australian and the Federal Territory lines had operating ratios under 100 per cent.

Passenger revenues during the year amounted to $1,649,500 as against $1,434,700 for the previous year. Freight receipts likewise rose from $994,000 in 1926-1927 to $1,271,800 in 1927-1928. These increases came despite falling traffic since the report shows 221,384 passengers carried and 224,613 tons of freight hauled during 1926-1927 as against respective 1927-1928 figures of 155,776 and 206,362. This decrease in traffic however, was confined to the five-mile Federal Territory line since all other units reported increases. The Federal Territory line carried 72,350 less passengers and hauled 42,602 less tons of freight than in 1926-1927, when it reported a net from operations equivalent to $22,900 as against its 1927-1928 deficit of $10,700.

Train mileage of all lines rose in 1927-1928 to 965,682 from a 1926-1927 total of 832,661 while revenues per train mile increased from the equivalent of $2.87 to about $2.98. Expenses per train mile, on the other hand, fell from $2.72 in 1926-1927 to $2.67 during the year under review.

The Commissioner expresses regret that further agreement has not been arrived at with the States in regard to works under the Uniform Railway Gage Scheme recommended by the Royal Commission in 1921. In this connection he states that railway systems of Australia are very seriously handicapped and that "each year of delay adds to the cost and makes the ultimate conversion more difficult."

Traffic

Package car service from Chicago to various points throughout the United States established a new high record in December when 84,000 cars were forwarded, according to figures compiled by the Chicago Association of Commerce. Approximately 93 per cent of the cars arrived at destination on time.

St. Louis-San Francisco passenger trains were 95.2 per cent on time throughout 1928 according to figures just compiled by General Manager F. H. Shaffer. A total of 61,863 passenger trains were operated on the company's 5,800 miles of lines in the southwest and southeast and 58,884 were on time.

The agricultural department of the Illinois Central is operating an exhibition car over the system to demonstrate the best methods of growing and packing vegetables. The exhibits illustrate the economical production of vegetables by better soil preparation and the different ways of packing and grading.

Railroad Fares Reduced Between Atlanta and Macon

The Central of Georgia and the Southern each announced last week that, beginning February 1, the fare (in day coaches) between Atlanta, Ga., and Macon, would be two dollars, one way, and three dollars, round trip. There will be a reduction also in fares to and from intermediate stations. The distance between these two cities is 87 miles by the Southern and 100 miles by the Central of Georgia. It is expected that motor coach lines between the two cities will make reductions in fares.

British to Pay Emigrant Ocean Fares

It will be announced in London shortly that the British government has agreed to pay the ocean fares of farm laborers recruited in Great Britain by the Canadian Pacific and the Canadian National.

Under the British Ministry of Labor farm training scheme 6,000 men will come to Canada passage-free between March and July, 1929, and this number will now be further augmented by about 5,000 recruits of the railways.

Uniform Through Export Bill of Lading

This is the title of Trade information bulletin No. 593, which has been issued by the Bureau of Foreign and Domestic Commerce, Washington. It is a pamphlet of 62 pages (price 10 cents) discussing in great detail all questions which have arisen among exporters concerning the merits and demerits of the uniform bill of lading for export shipments and the laws and government regulations having to do therewith. The issuance of the pamphlet follows a large number of conferences on behalf of the government with shippers, bankers and transportation interests, in 29 cities, and is a revision of a circular on the same subject which was published by the Bureau in April, 1925.

Switching Charges on Barge Traffic Found Unjustified

Switching charges proposed by the railways on freight between industries and the docks of the Mississippi-Warrior service of the federal barge line at St. Paul and Minneapolis were found unjustified in a decision by the Interstate Commerce Commission made public on January 29. The commission found that it had not been shown clearly that it would be lawful for the roads to charge, for switching on freight moving to and from the barge line terminals, higher rates than the reciprocal switching charges which they assess on corresponding traffic moving to and from connecting rail lines, provided the barge line pays the usual per diem reclaims on cars in switching service to and from its terminals and actual per diem for the detention of cars at its terminals. The roads had proposed to apply the industrial switching charges.

Freight Commodity Statistics

Class I railroads in the third quarter of 1928 originated 353,045,165 tons of revenue freight, an increase of 0.59 per cent as compared with the corresponding period in 1927, according to the Interstate Commerce Commission's quarterly summary of freight commodity statistics. For the three quarters of 1928 the originating tonnage was 935,752,821, a decrease of 3.52 per cent as compared with the corresponding period of 1927. The summary for the roads of the United States follows:

Commodity group	Tons originated, Third Quarter 1928	Per cent increase over same period in 1927
Products of agriculture	31,020,022	2.21
Animals and products..	6,015,932	*d5.33*
Products of mines.....	199,674,214	*d .60*
Products of forests....	23,638,231	*d5.46*
Manufactures and miscellaneous	83,354,281	6.30
All L. C. L. freight.	9,342,485	*d6.33*
Total	353,045,165	.59

Commodity group	Tons originated, Nine months 1928	Per cent increase over same period in 1927
Products of agriculture	77,009,381	1.50
Animals and products..	18,637,141	*d .82*
Products of mines....	506,574,688	*d7.15*
Products of forests....	73,047,417	*d4.49*
Manufactures and miscellaneous	233,061,459	3.91
All L. C. L. freight.	27,422,735	*d5.04*
Total	935,752,821	*d3.52*

D. L. & W. Tour Patrons Hold Reunion

A reunion of more than 500 patrons who last summer took advantage of the Lackawanna's series of nine "Wonder Week Tours," with officers of the railroad and representatives of the hotels and transportation companies which worked in conjunction with the railroad as their guests, was held on the evening of January 26 at the Hotel Pennsylvania in New York.

The meeting was in the form of a dinner and dance. Arrangements were made by the traffic department of the Lackawanna, acting in behalf of a number of patrons of the tour who conceived the idea that it would be pleasant to meet again with those who enjoyed the summer's trips with them as well as with the representatives of the companies who added to their comforts while enroute.

In all there were 583 seated in the dining room of the hotel. The toastmaster for the occasion was W. H. Dominick, general passenger agent of the railroad. The address of welcome was delivered by W. F. Griffitts, passenger traffic manager. President J. M. Davis, E. B. Moffatt, general superintendent, and other higher officers of the railroad were present. The names of the various courses on the menu were cleverly connected with various hotels and points of interest along the route of the tours.

Santa Fe Eliminates Waybill Errors

The Atchison, Topeka & Santa Fe, in the January issue of its Bulletin has described the uses and purposes of the waybill. Sixteen revising bureaus, established at important stations, revise all waybills received including bills from smaller stations so near that they can be sent quickly to the bureau.

Errors are thus brought to agents' attention promptly and adjustments made with patrons before they dispose of their goods. About 75 per cent of all waybills are revised by these bureaus, which revision is final except for tests to determine the degree of accuracy with which the work is being done. As a further aid the accounting department maintains an instructor for agents who devotes his entire time to explaining tariffs and impressing upon agents the necessity of their study of such tariffs.

As a result, the number of errors in the initial assessment of charges has been greatly reduced. During 1927 6,032,000 waybills were made and in addition there were handled 277,000 waybills from and to points on foreign roads, or a total of about 750,000 shipments a month.

The revision of these waybills by revising bureaus and the audit office disclosed 28,145 undercharges; aggregating $348,317 and 50,486 overcharges, aggregating $583,918—a total of 78,631 errors; or one to each 100 freight bills. A diligent effort is made to refund overcharges discovered, and of the $583,918 discovered in 1927, only $5,420, or about one per cent remained unrefunded on July 31, 1928.

Approximately $42,100,000 for new improvements on its lines is being planned by the Buenos Aires & Pacific of Argentina for 1929 according to reports coming from the South American road. Among the projects to come under this improvement program are a new terminal for Buenos Aires and the construction of a new elevated roadway 610 meters long.

Equipment and Supplies

Locomotives

THE AMERICAN ROLLING MILL COMPANY is inquiring for two oil electric locomotives of 70 tons' capacity for switching service.

THE ILLINOIS CENTRAL has ordered 17 eight-wheel switching locomotives from the Lima Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of January 12.

Freight Cars

THE HOCKING VALLEY is inquiring for 107 flat cars of 50 tons' capacity.

THE NORTHERN PACIFIC is inquiring for 500 gondola cars of 70 tons' capacity.

THE TIDE WATER OIL COMPANY has ordered 118 tank cars from the American Car & Foundry Company.

THE CHESAPEAKE & OHIO is inquiring for 2,000 hopper bottom steel gondola cars of 50 tons' capacity and 500 ventilated box cars of 40 tons' capacity.

THE ERIE has ordered five depressed center flat cars of 120 tons' capacity from the Standard Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of August 18.

THE SEABOARD AIR LINE has ordered 500 box car bodies from the Richmond Car Works. Inquiry for this equipment was reported in the *Railway Age* of January 19.

THE CHESAPEAKE & OHIO has given an order to the Hocking Valley shops at Logan, Ohio, to build 125 steel frame caboose cars. Inquiry for this equipment was reported in the *Railway Age* of January 12.

THE TEXAS & PACIFIC is inquiring for 500 steel underframe stock cars of 40 tons' capacity, 300 steel underframe, single sheathed box cars of 50 tons' capacity and 700 steel underframe, single sheathed box cars of 40 tons' capacity.

PICKANDS, MATHER & COMPANY have ordered 30 air dump cars of 25 cu. yd. capacity, from the Western Wheeled Scraper Company. Inquiry for this equipment was reported in the *Railway Age* of January 26.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 1,000 composite gondola cars of 70 tons capacity from the Pressed Steel Car Company; 1,000 box cars of 50 tons capacity from the American Car & Foundry Company and 250 flat cars of 50 tons capacity from the Ryan Car Company. Inquiry for this equipment was reported in *Railway Age* of October 27.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for new freight cars as follows:

1,200 automobile cars, 40 ft. 6 in. long
500 automobile cars, 50 ft. 6 in. long
1,000 ballast cars of 70 tons' capacity
300 ore cars of 70 tons' capacity
500 single deck stock cars
150 double deck stock cars
350 flat cars 45 ft. long
150 flat cars 50 ft. long

THE ATCHISON, TOPEKA & SANTA FE has ordered 25 Ingoldsby dump cars of 50 tons' capacity from the Koppel Industrial Car & Equipment Company; 75 hopper cars of 70 tons' capacity from the Ralston Steel Car Company and 75 hopper cars of 70 tons' capacity from the American Car & Foundry Company. This company is now inquiring for 200 flat cars of 50 tons' capacity.

Passenger Cars

HOCKING VALLEY—See Chesapeake & Ohio.

THE CHESAPEAKE & OHIO contemplates buying 12 express cars for its own use and three baggage and mail cars for the Hocking Valley.

THE BOSTON & MAINE has ordered 10 mail and baggage cars from the Osgood Bradley Car Company. Inquiry for this equipment was reported in the *Railway Age* of December 8.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered five dining cars and two parlor cars from the Pullman Car & Manufacturing Corporation, five baggage cars from the American Car & Foundry Company and 15 suburban cars from the Standard Steel Car Company.

THE LOUISVILLE & NASHVILLE has ordered four coaches; four coaches with end smoking compartments and four combination passenger and baggage cars, all to be 70 ft. long, from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of January 19.

THE ATCHISON, TOPEKA & SANTA FE has ordered 21 gas-electric rail motor cars from the Pullman Car & Manufacturing Corporation; the power units were ordered from the Electro-Motive Company. Inquiry for this equipment was reported in the *Railway Age* of December 15.

THE UNION PACIFIC has ordered 25 baggage cars from the Standard Steel Car Company, 25 coaches, 83 ft. long, with smoking rooms from the American Car & Foundry Company, five combination horse baggage cars from the Bethlehem Steel Company and five dining cars from the Pullman Car & Manufacturing Corporation.

THE ATCHISON, TOPEKA & SANTA FE has placed orders with the Pullman Car & Manufacturing Corporation for the following:

10 mail and baggage cars
10 chair smoking cars
10 chair cars
10 partition coaches
14 baggage cars

Inquiry for this equipment was reported in the *Railway Age* of December 8.

Iron and Steel

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered 5500 tons of 130-lb. rail for its main line renewals during 1929; the order was given to the Bethlehem Steel Company.

THE ILLINOIS CENTRAL has ordered 11,000 tons of rails from the Illinois Steel Company, 7,000 tons from the Inland Steel Company and 12,000 tons from the Tennessee Coal, Iron & Railroad Company.

THE NEW YORK CENTRAL has ordered 500 tons of structural steel for a bridge at Toledo, Ohio, from the McClintic-Marshall Company and 300 tons for a bridge at Cleveland, Ohio, from the Mt. Vernon Bridge Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 32,300 tons of rails from the Illinois Steel Company, 10,700 tons from the Colorado Fuel and Iron Company and 7,000 tons from the Inland Steel Company.

THE NEW YORK, CHICAGO & ST. LOUIS has divided orders for 22,800 tons of rails equally among the Carnegie Steel Company, the Bethlehem Steel Company, the Inland Steel Company and the Illinois Steel Company. This company is now inquiring for 5,200 kegs of spikes and 1,600 kegs of track bolts.

THE CHICAGO, BURLINGTON & QUINCY has ordered 28,700 tons of rails from the Illinois Steel Company, 14,350 from the Inland Steel Company and 7,000 from the Colorado Fuel and Iron Company. In addition, 6,100 tons have been ordered for the Colorado Southern and 3,900 tons for the Ft. Worth & Denver City from the Colorado Fuel and Iron Company.

Machinery and Tools

THE BOSTON & MAINE has ordered seven 15-ton gasoline-driven cranes of a new type, to be delivered in April. Five units are already in operation. The cranes are self-propelling and capable of hauling cars.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for:

One 24 in by 7 ft. lathe
Two 3 in. by 24 in. grinders
One saw
One drill grinder
One vertical milling machine
One 20 in. by 7 ft. lathe
One 16 in. by 6 ft. lathe
One 24 in. by 12 ft. lathe
One 28 in. draw cut shaper

Signaling

THE LOUISVILLE AND NASHVILLE has ordered, from Union Switch & Signal Company material for automatic block signals at Etowah, Tenn., southward to Junta near Cartersville, Ga., eighty-eight miles single track. Semaphores style T-2 will be used.

Supply Trade

Walter S. Campbell, railroad sales representative, eastern district of **Joseph T. Ryerson & Son, Inc.,** has resigned, effective February 1, to enter another field of business.

Lloyd R. Wells, formerly representative of the **Carbon Steel Company** and the **Midvale Steel Company,** has been appointed representative of **Theodore Geissmann & Company, Inc.**

Ray J. Beahan of the engineering department of the **Stefco Steel Company,** Michigan City, Ind., has been appointed district engineer in charge of the Chicago office in Room 1832, McCormick building.

Wm. Z. Coleman of T. C. Coleman & Sons, Starke building, Louisville, Ky., has been appointed district sales representative in Kentucky and Tennessee for the **Woodings Forge & Tool Company,** Verona, Pa.

H. E. McKee, assistant general manager of the **Electric Railweld Service Corporation,** has been promoted to general manager, with headquarters as before at Chicago, to take over the duties formerly performed by H. W. Morrison, president.

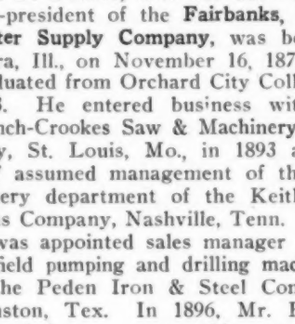
R. H. Gwaltney has been appointed sales vice-president of **The Gould Coupler Company,** with headquarters at New York. Mr. Gwaltney was also elected a director of the company to take the place of **George L. L. Davis,** who resigned on January 1.

The Prest-O-Lite Company, Inc., New York, has opened a new acetylene plant at Memphis, Tenn. It will supply nearby industries with dissolved acetylene for oxy-acetylene welding and cutting. **J. Brown** is superintendent of the plant and **C. A. Anderson,** whose headquarters are at Birmingham, is district superintendent.

Burton Mudge, first vice-president of the Bradford Corporation has resigned to become president of the **Mudge Corporation,** a company recently organized to deal in railroad equipment, with offices in Room 1605, 333 North Michigan avenue, Chicago. **Leslie C. Seward** has been elected secretary and treasurer of the Mudge Corporation.

L. C. Bihler, eastern traffic manager of the **Universal Portland Cement Company** and traffic manager of the **Carnegie Steel Company,** with headquarters at Pittsburgh, Pa., has been promoted to assistant to the president and general traffic manager of the Carnegie Steel Company. He will be succeeded by **Frank E. Guy,** assistant eastern traffic manager of the Universal Portland Cement Company, as eastern traffic manager of the latter company with headquarters at Pittsburgh, Pa. **Murray N. Billings,** traffic manager of the **Illinois Steel Company,** has also been appointed western traffic manager of the **Universal Portland Cement Company,** with headquarters at Chicago to succeed **F. T. Bentley,** who retired during the past year.

P. D. Bowler, who has been elected vice-president of the **Fairbanks, Morse Water Supply Company,** was born at Flora, Ill., on November 16, 1872, and graduated from Orchard City College in 1893. He entered business with the Branch-Crookes Saw & Machinery Company, St. Louis, Mo., in 1893 and in 1897 assumed management of the machinery department of the Keith-Simmons Company, Nashville, Tenn. Later he was appointed sales manager of the oil field pumping and drilling machinery of the Peden Iron & Steel Company, Houston, Tex. In 1896, Mr. Bowler entered into a partnership agreement with M. E. Layne, forming the firm of Layne & Bowler, which firm was later incorporated as the Layne & Bowler Company, Mr. Bowler being elected vice-president and sales manager. In 1910, Mr. Bowler went to California



P. D. Bowler

and organized the Layne & Bowler Corporation of which he was elected president and general manager. Several years thereafter he sold his controlling interest in this company to M. E. Layne and went into the oil well drilling, contracting and developing business. In 1926, Mr. Bowler entered into negotiations with Fairbanks, Morse & Company which resulted in the formation of the Fairbanks, Morse Water Supply Company, with Mr. Bowler as vice-president and general manager.

F. W. Anderson, vice-president and general manager of the **Northwestern Motor Company,** Eau Claire, Wis., has been elected president and general manager to succeed **R. R. Rosholt,** president, who has been elected chairman of the board. Mr. Anderson was born at Eau Claire on October 9, 1890. He served a four-year apprenticeship as a machinist with the Northwestern Steel & Iron Works at Eau Claire and during 1910 was employed as a machinist in the shops of the Atchison, Topeka & Santa Fe at Topeka, Kan. In 1911 he entered the employ of the Northwestern Motor Company as a draftsman, later holding various positions as shop foreman, engineer and general superintendent. During 1919 he was efficiency engineer for the Ingersoll Milling

F. W. Anderson

Machine Company at Rockford, Ill. In October, 1920, he was elected vice-president and general manager of the Northwestern Motor Company, which position he has held until his recent election.

Obituary

President **F. L. Sivyer** of the Sivyer Steel Castings Company, Milwaukee, Wis., also president of the Malleable Iron Research Institute, Cleveland, Ohio, and at one time president of the Joliet Railway Supply Company, Chicago, died on January 22, following injuries received in an automobile accident in Milwaukee, Wis.

Trade Publications

DREADNAUGHT BUCKETS.—A well illustrated 25-page catalogue has been issued by the Blaw-Knox Company, Pittsburgh, Pa., describing the various types of dreadnaught buckets which are manufactured by that company for various classes of work. The catalogue also contains a ready reference chart, with summarized information concerning all of its buckets of this type.

GROWING NEW FORESTS.—This is the title of an informative and attractively illustrated booklet issued by the St. Paul & Tacoma Lumber Company, Tacoma, Wash., which, in the main, deals with the reforestation program which that company is carrying on in connection with its timber lands of Douglas fir in the Northwest. The booklet also points out many facts of general interest to the wood consuming interests of the country in connection with the general subject of reforestation.

Construction

BUFFALO, ROCHESTER & PITTSBURGH.—This company has awarded a contract to the Harrison Engineering & Construction Company, Buffalo, N. Y., for the elimination of a grade crossing and grading and concrete work along its line at Orchard Park, N. Y. The project will cost about $75,000. Bids also have been received for the elimination of another grade crossing in the same city which will cost approximately $175,000.

CENTRAL OF GEORGIA—This company contemplates the construction of bridges over the Flint river on its line near Montezuma and near Reynolds, Ga.

MOBILE & OHIO.—This company plans to take bids about February 1 for the construction of an 18-stall roundhouse, boiler house and locker building at East St. Louis, Ill., which will cost about $225,000.

NEW YORK CENTRAL.—This road has made application to the Public Service Commission of New York for the right to exercise a franchise, build and operate a branch track from its Oswegatchie line, about 3,300 ft. west of Emeryville station, St. Lawrence county, N. Y., south a distance of about four miles to the mines of the St. Joseph Lead Company. The road also asks the commission to determine the manner in which the tracks will cross three town highways and the Governeur-Edwards state highway. The proposed branch is to provide shipping facilities for the mining company and is expected to move about 1,900 cars per year. The railroad's plan calls for crossing the three town highways at grade and carrying the track over the state highway on a bridge, thereby making no change in the existing grade of the highway.

ST. LOUIS, SAN FRANCISCO & TEXAS.—In various applications filed with the Interstate Commerce Commission authority is asked for the construction of extensions of this line and the Gulf, Texas & Western to afford an additional through route between Amarillo and Vernon, and Fort Worth, Tex. The St. Louis-San Francisco has applied for authority to acquire control of the Gulf, Texas & Western, extending from Salesville Junction to Seymour, Tex., 99 miles, and the latter has applied for authority to build an extension from Seymour to a point near Paducah, 71 miles. The St. L. S. F. & T., also asks authority to extend its line from Vernon to Seymour, 42 miles, thus connecting the line of the G. T. & W., with the line of the Frisco system, and also authority to acquire trackage rights over a line of the Chicago, Rock Island & Gulf between Jacksboro and Fort Worth, 71.6 miles. It is stated that the C. R. I. & G. will ask for a certificate for the construction of a line from Groom to Paducah and for the acquisition by joint trackage agreement of a line between Paducah and Jacksboro.

PENNSYLVANIA.—A contract has been awarded by this company to the M. A Long Company, Baltimore, Md., for the construction of produce store buildings for the Potomac Freight Terminals Company, fronting on Water street between Twelfth and Thirteen-and-one-half streets, N. W., in Washington. D. C., at a cost of approximately $380,000. A contract for the erection of the steel work for a viaduct across Legionville Hollow and a bridge over Township Road on its Economy branch extension at Legionville, Pa., has been given to the American Bridge Company, Pittsburgh, Pa.

Railway Finance

ALLEGHANY CORPORATION.—*Organization by Van Sweringen.*—O. P. and M. J. Van Sweringen have organized this corporation to take over the holdings of themselves and their associates in the Chesapeake Corporation, the Chesapeake & Ohio, the Nickel Plate, the Erie, and the Buffalo, Rochester & Pittsburgh. The new corporation which has a Maryland charter has stocks of a market value in excess of $84,000,000. Capitalization will consist of $35,000,000 of 15 year collateral trust convertible five per cent. bonds, 250,000 shares of $100 preferred and $3,500,000 of no par common stock. The bonds are being offered to the public at par by J. P. Morgan & Company, the First National Bank, the Guaranty Company and the National City Company. In addition to the capital to be outstanding there will be 750,000 shares of preferred and 4,000,000 shares of common authorized for ultimate issue. The preferred stock now to be issued will carry warrants for the purchase of 375,000 shares of common at $30 per share. Of the unissued preferred 245,000 shares will be reserved for the conversion of bonds. An additional 350,000 shares of common will be reserved for bond conversion and 1,725,000 shares will be reserved against the exercise of warrants sold to organizers of the corporation. The bonds will be convertible at holders option into seven shares of preferred stock without warrants at $100 and 10 shares of common stock at $30 for each $1,000 bond. The bonds will be due in 1944 and will be redeemable at any time at $102.5. The aggregate value of the assets of the corporation including cash as a result of the issue of securities presently to be outstanding will be in excess of $130,000,000. The indenture provides for maintenance of a security reserve of at least 150 per cent. of bonds outstanding.

CHESAPEAKE & OHIO.—*Bonds.*—A banking syndicate headed by J. P. Morgan & Co., and including Kuhn, Loeb & Co., the Frist National Bank, Guaranty Company and the National City Company has made a public offering of $24,784,000 of this company's refunding and improvement mortgage 4½ per cent bonds, series A, at 95 to yield over 4.74 per cent. The bonds mature in 1993.

CHESAPEAKE & OHIO.—*Stock Issue.*—Oral arguments were heard by the Interstate Commerce Commission on January 29 on this company's application for a modification of the commission's order to enable it to issue 300,000 shares of common stock at par, instead of 200,000 at $150 as authorized by the commission, and also to enable it to pay $133.33 a share for stock of the Pere Marquette held by the New York, Chicago & St. Louis. There was no opposition. Thomas B. Gay, representing minority stockholders of the C. & O., who had opposed the application for authority to acquire control of the Erie and also that as to the Pere Marquette on the terms originally proposed, stated that they were not opposed to the issue of stock at par and were now satisfied to leave the question of the price to be paid for Pere Marquette stock to the commission. Robert B. Tunstall, assistant general counsel of the C. & O., told the commissioners they would be assuming a grave responsibility in fixing the price at which stock is to be issued and also that Congress had not intended the commission to fix the issue price. He said the commission is performing a valuable function in seeing that stock issues are adequately supported by assets but that for it to assume the function of deciding the price would tend to shake the confidence of the business world in the commission. He also pointed out that both before and after the decision in this case the commission has authorized roads to issue stock at par while the market prices were high and that the applicant does not know what differentiating condition was in the commissions mind in this case.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line from Newcastle, Wyo., to Cambria, 6.9 miles.

DELAWARE, LACKAWANNA & WESTERN.—*Bonds.*—The Morris & Essex and the D. L. & W., in a joint application to the Interstate Commerce Commission, have asked authority for an issue of $15,000,000 of construction mortgage gold bonds by the Morris & Essex, to be guaranteed by the Lackawanna and to be delivered to it in reimbursement for unfunded advances.

EASTERN KENTUCKY SOUTHERN.—*Acquisition and Operation.*—The Interstate

Commerce Commission has authorized this company to acquire and operate a railroad from Grayson, Ky., to Webbville, 13.4 miles. This is a portion of the line formerly operated by the Eastern Kentucky Railway.

HILL CITY.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its 17.5-mile line from Mississippi Jct., Minn., to Hill City, together with a 6.7-mile branch.

IMPERIAL RAILROAD. — *Construction.* — The Interstate Commerce Commission has denied the application of this company for authority to construct a line of railroad from a connection with the Gulf & Ship Island at Mendenhall, Miss., to Birmingham, Ala., 294 miles, including branches.

MANISTEE & NORTHEASTERN.—*Acquisition of Control.*—The Interstate Commerce Commission has authorized this company to acquire control of the properties of the Leelanau Transit Company by lease. The lessor's line extends from Hatch's Crossing, Mich., on the Manistee's line between Solon and Traverse City to Northport, 24.5 miles. The lessee will pay an annual rental of $596.95 for the first five years and $1,286.85 for the balance of the term of the 20-year lease.

MINNEAPOLIS & ST. LOUIS.—*Foreclosure*—Foreclosure and sale of this company to satisfy the demands of creditors was ordered in a final decree signed by Judge Wilbur F. Booth of the United States Circuit Court at Minneapolis, Minn., on January 29 and filed in the Federal District Court on the same day. The sale is subject to appeal. Howard S. Abbott, who has been master in chancery since the railroad was thrown into receivership on July 26, 1923, was appointed as a special master in the foreclosure proceedings. Numerous exceptions to a report made by Mr. Abbott on the receivership proceedings which was filed with the court on May 22, 1928, were overruled by Judge Booth.

RAILWAY EXPRESS AGENCY.—*Bonds.*—J. P. Morgan & Co., Kuhn, Loeb & Co., the First National Bank and the National City Company of New York, have offered at par $32,000,000 of 5 per cent serial bonds, series A, of this company to be dated March 1, 1929, and mature serially $800,000 semi-annually to 1949. Bonds are to be redeemable on 60 days' notice after 1939 at par and accrued interest plus a stipulated graduated premium. The issue is subject to approval by the Interstate Commerce Commission and the bankers announce that it has been fully subscribed.

SOUTHERN PACIFIC. — *Terminal Line Acquired.*—The Railroad Commission of California has granted permission to this company to acquire the Industrial Terminal Railroad Company, which owns real estate at Los Angeles, Cal., upon the basis of an exchange of 4,166 shares of Southern Pacific stock and cancellation of indebtedness amounting to $28,601. The present value of the property of the company is about $700,000.

ST. LOUIS & O'FALLON.—*Date of Recapture Order Postponed.*—The Interstate Commerce Commission has again postponed, from February 15 to April 30, the effective date of its recapture order which is involved in the case pending in the Supreme Court.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon 55.34 miles of its line in Missouri, from Brownwood to Aquilla, 9.95 miles; from Bloomfield to Campbell, 34.8 miles; and from Tallipoosa to Wardell, 10.59 miles.

TERMINAL R. R. ASSOCIATION OF ST. LOUIS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $8,000,000 of general mortgage refunding 4 per cent sinking fund gold bonds to be sold to J. P. Morgan & Co., at not less than 87, which will make the annual cost to the railroad 4.93 per cent. They will mature in 1953. The St. Louis Bridge Company has been authorized to issue $5,000,000 of renewal first mortgage 7 per cent bonds to be delivered to the Terminal Association as reimbursement for expenditures made in paying a like amount of securities of the Bridge Company maturing April 1, 1929.

Dividends Declared

Central Railroad of New Jersey.—2 per cent, quarterly, payable February 15 to holders of record February 4.

Illinois Central.—Common, $1.75, quarterly; Preferred, $3.00, semi-annually, both payable March 1 to holders of record February 8.

Lehigh Coal & Navigation.—$1.00, quarterly, payable February 28 to holders of record January 31.

Minehill & Schuylkill Haven.—$1.25, payable February 1 to holders of record January 18 to January 31.

Pennsylvania.—$.87½, quarterly, payable February 28 to holders of record February 1 a.

Reading.—First Preferred, quarterly, $.50, payable March 14 to holders of record February 20.

Average Prices of Stocks and of Bonds

	Jan. 29	Last week	Last year
Average price of 20 representative railway stocks.	132.07	132.83	118.73
Average price of 20 representative railway bonds.	93.08	92.32	97.11

* * *

On the Boston & Albany

Officers

Executive

Harry Burgess, who, following his appointment as governor of the Panama Canal was elected president of the Panama railroad, with headquarters at Balboa Heights, C. Z., was born on February 22, 1872, at Starkville, Miss., He attended the Mississippi Agricultural & Mechanical College and graduated from the United States Military Academy in June, 1895, and was commissioned a second lieutenant, later attending the Engineer School of Application. Since that time he has been promoted through all grades to the rank of Colonel in the

Harry Burgess

Corps of Engineers of the United States Army. During his career as an army engineer Mr. Burgess has been engaged in river, harbor and irrigation work and lake surveys on the Gulf of Mexico, the Mississippi river, the San Carlos project and Lake Superior, and including surveys and plans for the Muscle Shoals power development. In 1924 he was transferred to the Canal Zone as engineer of maintenance of the Panama Canal. Since 1925 he had been vice-president and second vice-president of the Panama Railroad. Mr. Burgess was appointed governor of the Panama Canal in September, 1928. During the World war he was in command of an American railway regiment in France.

Andrew J. Hancock, who has been promoted to assistant to the vice-president in charge of operation of the Southern Pacific, with headquarters at San Francisco, Cal., has been in railway service for more than 26 years. He was born on March 4, 1880, at Frankfort Ky., and after attending high school became a clerk and later a messenger for the Adams Express Company in August, 1899. From September, 1901, to July, 1903, Mr. Hancock served as a telegrapher and clerk with the Postal

Telegraph-Cable Company, the Western Union Telegraph Company, the Louisville & Nashville, the Louisville, Henderson & St. Louis, the Union Pacific and the Kansas City Southern. He then first entered the service of the Southern Pacific as a stenographer in the office of the superintendent of telegraph where he remained until January, 1904, when he became cashier for the United States Life Insurance Company. In August of the same year he reentered railway service, serving successively

Andrew J. Hancock

until 1913 as clerk and chief clerk to a division superintendent and as a telegrapher on the Southern Pacific, as a train dispatcher and chief clerk to the general manager of the Kansas City, Mexico & Orient and as assistant chief clerk to the general manager of the Southern Pacific. Mr. Hancock was then promoted in April, 1913, to chief clerk to the vice-president and general manager of the Southern Pacific, being further advanced to supervisor of transportation in October, 1921. In January, 1924, he was promoted to assistant to the general manager, his promotion to assistant to the vice-president in charge of operation becoming effective on January 1.

Financial, Legal and Accounting

W. E. Davis, acting auditor of disbursements of the Eastern and Western lines of the Atchison, Topeka & Santa Fe, has been promoted to auditor of disbursements of those lines, with headquarters as before at Topeka, Kan.

Operating

F. H. Christian, acting superintendent of the Southern division of the Gulf, Colorado & Santa Fe, has been promoted to superintendent of that division, with headquarters as before at Temple, Tex.

John R. Hitchcock, acting general manager of the Western Lines of the Atchison, Topeka & Santa Fe, has been promoted to general manager of the same lines, with headquarters as before at Amarillo, Tex. Mr. Hitchcock has been in railway service for 39 years, all but one of which were spent with the Santa Fe. He was born at Woolwich, England, on July 6, 1873, and attended the public schools at Marshalltown Iowa, and Oskaloosa, entering railway service in 1890 as a messenger in a telegraph office on the Iowa Central (now part of the Minneapolis & St. Louis). From 1891 to 1897 Mr. Hitchcock served consecutively as a clerk and timekeeper in the office of the division superintendent and master mechanic on the Atchison, Topeka & Santa Fe at San Marcial, N. M., and as clerk and stenographer to the general master mechanic, the superintendent of transportation and the general superintendent of the Atlantic & Pacific (now part of the Santa Fe) at Albuquerque, N. M. He then returned to the Santa Fe and was employed successively by the Coast lines at Los Angeles, Cal., as stenographer, clerk, chief clerk and assistant to the general manager until February, 1905, when he was promoted

John R. Hitchcock

to superintendent at San Bernardino, Cal. On January 1, 1920, he was further promoted to assistant general manager of the Coast lines, with headquarters at Los Angeles. Late in 1928 Mr. Hitchcock was appointed acting general manager of the Western lines, his promotion to general manager becoming effective on January 22.

Traffic

Hall G. Williamson has been appointed general agent of the Chicago & Illinois Midland at Dallas, Tex.

A. L. Miller has been appointed assistant general passenger agent of the New York Central Lines, with headquarters at New York.

P. L. Sanford has been appointed assistant superintendent of colonization and development for the Maritime Provinces of the Canadian Pacific, with headquarters at Kentville, N. S.

J. H. Davis has been appointed passenger agent of the Norfolk & Western, with headquarters at Norfolk, Va. Mr. Davis will solicit passenger traffic in the Norfolk district, reporting to the district passenger agent at Richmond, Va.

George F. Weston has been appointed industrial agent of the Erie, with headquarters at New York. **L. C. Kerner** has been appointed industrial agent, with headquarters at Cleveland, O. The position of industrial agent at Chicago, Ill., has been abolished.

John E. Wagner, district passenger agent of the Norfolk & Western, with headquarters at Richmond, Va., has been appointed general agent, with headquarters at Chattanooga, Tenn., succeeding W. L. Rohr, retired. Mr. Wagner will have charge of the solicitation of passenger traffic in the Chattanooga district.

Wilfred McNaught Knapp, general freight agent of the Central of Georgia, with headquarters at Savannah, Ga., has been appointed assistant freight traffic manager, with the same headquarters. Mr. Knapp was born at Atlanta, Ga., on October 3, 1883. He was educated in the public schools and entered railway service with the Clyde Charleston Fast Freight Line, in February, 1901, later serving with the New York & Texas Steamship Company. He entered the service of the Central of Georgia in

Wilfred McNaught Knapp

September, 1904, serving in various positions until 1918, when he was appointed executive chief to the regional director of the Southern Region of the United States Railroad Administration. In 1919 Mr. Knapp was appointed general freight agent at Savannah, and he served in that capacity until his recent appointment as assistant freight traffic manager.

E. D. Ainslie, who has been appointed general passenger agent of the Baltimore & Ohio, with headquarters at New York, was born at Sandusky, O., on April 19, 1875, and was educated in the public schools of Denver, Colo., and Brooklyn, N. Y., and Polytechnic Institute, Brooklyn. He entered the service

of the Baltimore & Ohio as assistant ticket agent at New York on May 1, 1892, and subsequently served as ticket agent at New York, passenger and ticket agent at Brooklyn, N. Y., and district passenger agent at New York. In June, 1918, he was appointed agent of the consolidated ticket office at Baltimore, Md., later serving in the same capacity at the Camp Meade consolidated office, returning to Baltimore in November, 1919, in the same position. Mr. Ainslie was appointed general passenger agent at St. Louis on March 1, 1920, and was transferred in a similar capacity to Washington, D. C., on November 1, 1926, in which position he served until his recent appointment as general passenger agent.

Robert A. Williamson, who has been promoted to general freight agent of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been in the service of that railway for 11 years. He was born on May 11, 1882, at Pittsburgh, Pa., and entered railway service on May 1, 1904, in the local freight station of the Pennsylvania at Pittsburgh. Two years later he became a percentage clerk on the Wabash-Pittsburgh Terminal & Railway (now the Pittsburgh & West Virginia), then advancing to chief clerk in the freight department. For a short time in 1918 Mr. Williamson served as chief tariff clerk on the Buffalo, Rochester & Pittsburgh, being appointed chief tariff clerk of the Nickel Plate in February of that year. From May, 1920, to February, 1926, he was successively chief clerk to the chief of the tariff bureau and chief of the tariff bureau and on the latter date he was promoted to assistant general freight agent, with headquarters at Cleveland. Mr. Williamson was appointed acting general freight agent on August 1, 1928, his promotion to general freight agent becoming effective on January 1.

Engineering and Maintenance of Way

L. J. Hughes, special engineer of the Chicago, Rock Island & Pacific has been promoted to engineer of maintenance of way of the system with headquarters as before at Chicago. Mr. Hughes succeeds **I. Bloom** who retired from active duty on February 1 after nearly 40 years of railway service.

Arthur C. Bradley, who has been promoted to engineer of maintenance of way of the First district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, has been in the engineering department of that railway for more than 16 years. He was born on December 13, 1880, at Brooklyn, N. Y., and graduated from the Stockton (Kan.) high school in 1898 and from the School of Civil Engineering of the University of Kansas in 1902. He entered railway service in January, 1903, as a rodman on the Atchison, Topeka & Santa Fe, serving in various positions to assistant engineer on preliminary and location surveys, construction and maintenance in New Mexico, Texas, and Illinois until March, 1911, when he became an assistant engineer on the St. Louis-San Francisco. In June, 1911, he was appointed an assistant engineer on the Rock Island at Davenport, Iowa, being promoted in February, 1912, to office engineer in the office of the engineer of maintenance of way of the First district at Davenport, and later being transferred to Des Moines. In March, 1913, Mr. Bradley was promoted to roadmaster on the East Iowa division at Iowa City, Iowa, where he remained until October, 1914, when he was further promoted to division engineer of the Oklahoma division at El Reno, Okla. During the World War he served in the United States as captain of the

Arthur C. Bradley

312th Engineers, and of the 512th Engineers, at Camp Pike, Ark. In France he was captain and acting battalion commander of the latter unit. On his return from military service in 1920, he was appointed division engineer of the Colorado division of the Rock Island at Colorado Springs, Colo., being transferred successively to the Chicago Terminal, the Nebraska-Colorado, the Missouri and the Illinois divisions. Mr. Bradley's promotion to engineer of maintenance of way of the First district became effective on January 1.

Purchases and Stores

Robert H. Adams, assistant purchasing agent of the Los Angeles & Salt Lake, has been promoted to purchasing agent, with headquarters at Los Angeles, Cal., succeeding **N. H. Foster,** deceased.

Mechanical

R. G. McAndrew has been appointed mechanical engineer of the New York, Ontario & Western, with headquarters at Middletown N. Y., succeeding **W. H. Davis,** retired.

Obituary

James M. Barr, at one time president of the Seaboard Air Line, died at the University hospital, Charlottesville, Va., on January 10, after a long illness.

U. H. Broughton, at one time president of the Virginian, died on January 30 at his home in London, England, from septic pneumonia.

Herbert H. Hill, general manager, auditor and traffic manager of the Alabama, Florida & Gulf, with headquarters at Dothan, Fla., died on January 18, from injuries received when he was struck by an automobile in that city.

George J. Charlton, passenger traffic manager of the Chicago & Alton, with headquarters at Chicago, died at his home in that city on January 28. Mr. Charlton had been in the service of the Alton for nearly 54 years.

Arthur D. Palmer, advertising manager of the New York Central, with headquarters at New York, died on January 29 in St. John's Riverside hospital from injuries received when he was struck by a bus. Mr. Palmer was 45 years old and had been in the service of the New York Central since November, 1905, having served in various capacities until July, 1927, at which time he was appointed advertising manager. For a number of years Mr. Palmer was manager of the time table department and among other duties was included the issuing of all time tables for the New York Central Lines.

William E. Mullins, engineer and railroad builder and former general traffic manager of the United Fruit Company, died on January 29 at the Hotel Windermere, New York, after an illness of several months duration. Mr. Mullins was born at Stratford, Ont., and was educated at the University of Toronto. He first served as general superintendent of the Central Vermont and later went to Central America as general manager of the Costa Rican Railway and the Northern Railroad of Costa Rica. In 1912 he was appointed general manager of the Costa Rica division of the United Fruit Company, in addition to holding the two other positions. In 1915 he returned to New York as general traffic manager of the latter company, resigning from this position in 1920 to return to Central America to take up railroad work. Mr. Mullins was actively connected with the planning and building of the International Railroad of Central America.

INFORMACIONES Y MEMORIAS DE LA SOCIEDAD DE INGENIEROS DEL PERU, the official monthly publication of the Engineering Association of Peru, in December issued a special edition in English in honor of the visit of President-elect Hoover. This issue contains, among others, an article on railway development, actual and prospective, in that country.